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## **Norfolk Harbor Improvement Study, Virginia**

Norfolk Harbor Deepening and Widening Ship Simulation Results

S. Keith Martin and Dennis W. Webb

September 2019



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# **Norfolk Harbor Improvement Study, Virginia**

## **Norfolk Harbor Deepening and Widening Ship Simulation Results**

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## Abstract

In 2018, the U.S. Army Engineer Research and Development Center (ERDC), Coastal and Hydraulics Laboratory, participated in a navigation study to assist the Virginia Port Authority evaluation of a proposed channel widening alternative for the Port of Norfolk, Virginia. The proposal will allow large coal colliers and containerships to load to a deeper draft. The proposals also included deepening portions of Norfolk Harbor and providing additional widening in one section for two-way traffic.

The simulations were conducted at the Maritime Institute of Technical and Graduate Studies (MITAGS) facility in Linthicum, MD. Moffatt & Nichol directed the simulation and modeling efforts, with assistance from Webb Simulation Consulting. The U.S. Army Engineer District, Norfolk, and ERDC provided oversight to ensure that all U.S. Army Corps of Engineers simulator study requirements were met.

The MITAGS simulator includes a variety of environmental forces act upon the ship during the simulation transit. These include currents, wind, waves, bathymetry, and ship-to-ship interaction.

Online simulations of the project were conducted at MITAGS. Seven mariners including harbor pilots and a master mariner participated in the testing and validation exercises.

Results in the form of track plots and pilot questionnaires were reviewed to develop final conclusions.

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## Preface

This study was conducted for the Virginia Port Authority, under MIPR 3K3V3-B5G942.

The work was performed by the Navigation Branch of the Navigation Division, U.S. Army Engineer Research and Development Center, Coastal and Hydraulics Laboratory. At the time of publication of this report, Mr. Timothy Shelton was Chief, Navigation Branch; Dr. Jacqueline Pettway was Chief, Navigation Division; and Mr. Charles E. Wiggins was the Technical Director for Navigation. The Director of ERDC-CHL was Dr. Ty V. Wamsley.

The ship simulation study technical lead was Mr. Eric Smith of Moffatt & Nichol. Mr. Jeffery Oskamp, Ms. Gwen Lawrence of Moffatt & Nichol, and Ms. Colleen Schaffer of MITAGS directed daily operation of the ship simulator. Mr. Jon Gage of Moffatt & Nichol was project manager. Pilots for all simulations (except for the Atlantic Ocean Channel) were provided by the Virginia Pilot Association. Atlantic Ocean Channel simulations were piloted by Captain Larry Bergin.

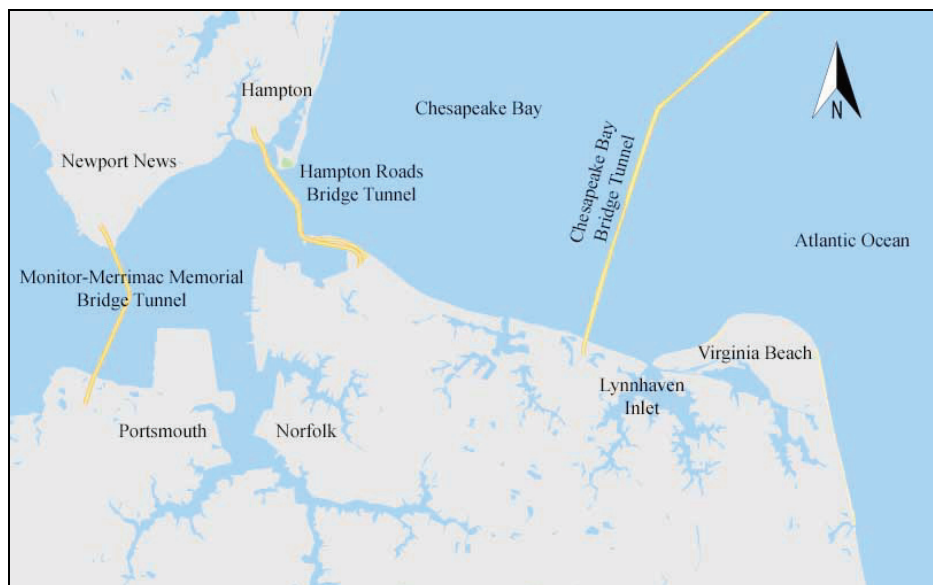
The Commander of ERDC was COL Teresa A. Schlosser, and the Director was Dr. David W. Pittman.

# 1 Introduction

## Background

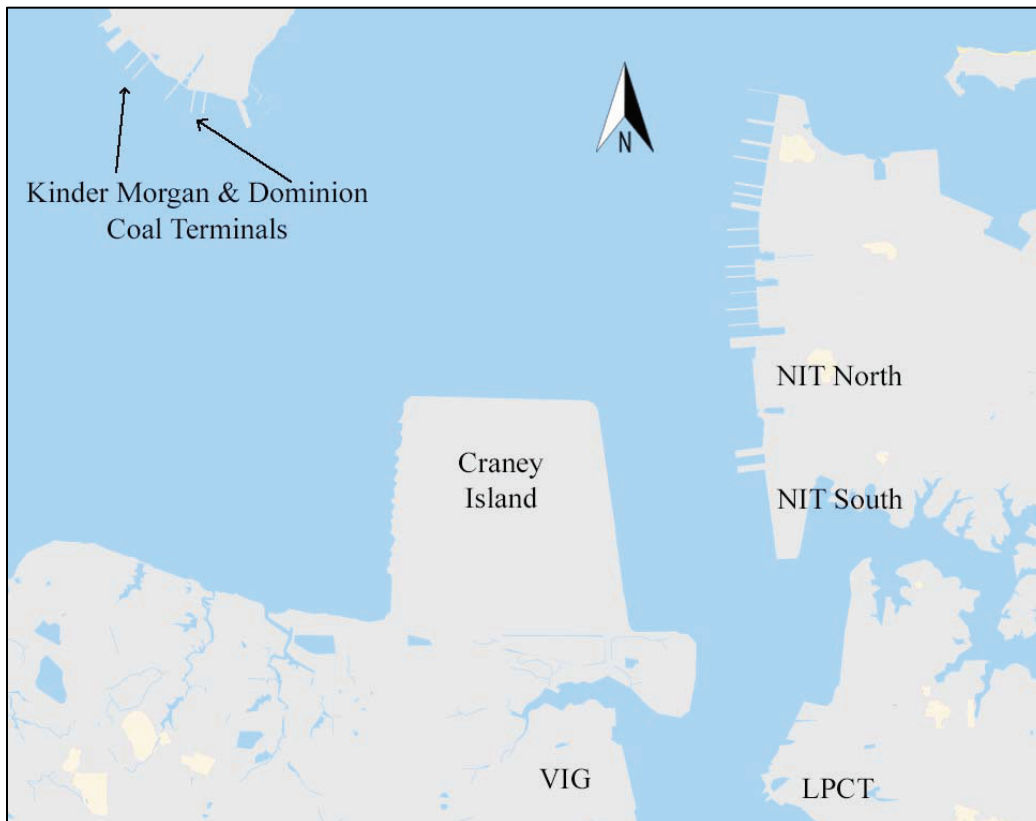
Norfolk is located on the eastern coast of the Commonwealth of Virginia (Figure 1). The existing Norfolk Harbor and Channels project consists of a network of federally improved channels extending from the Atlantic Ocean, through the Chesapeake Bay, and into the Port of Hampton Roads. Norfolk Harbor is the nation's largest coal export port and is the third largest container port on the U.S. east coast. The largest containerships and coal carriers calling on the U.S. east coast call at Norfolk Harbor. The fleet of coal ships and containerships regularly calling on Norfolk Harbor and channels includes vessels that are depth constrained at the existing channel depth. To allow deeper-drafted coal colliers and containerships to transit the Norfolk Harbor channels and to provide a section of channel for two-way traffic of the larger ships, deepening and widening channel improvements are proposed. The project is being developed under the authority of the Water Resources Development Act of 1986 (Public Law 99-662). This law authorized the construction of the Norfolk Harbor and Channels, Virginia, Project as described in House Document 99-85, dated 18 July 1985, entitled "Norfolk Harbor and Channels, Virginia." The local sponsor is the Virginia Port Authority (VPA).

Figure 1. Project vicinity map.



Two containership terminals and three coal terminals will accommodate the deeper-drafted ships (Figure 2). The two containership terminals are the Norfolk International Terminals (NIT), which have both north and south docks, and the Virginia International Gateway (VIG). A proposed third containership terminal is proposed for Craney Island. However, construction of that facility is estimated to be 20 years in the future, and it is not part of this study. The Portsmouth Marine Terminal is past the southern end of the proposed channel improvements. Upgrades to accommodate deeper drafting vessels are not planned for this terminal, and therefore it is not part of this study. Newport News Marine Terminal is located near the western terminus of the Newport News Channel and is likewise not anticipated to be reconfigured to accommodate deeper-drafting vessels. Two of the coal terminals, Dominion and Kinder Morgan, are in Newport News. The third coal terminal is the Lamberts Point Coal Terminal (LPCT) in Norfolk.

Figure 2. Location of container and coal terminals.



**Objective**

**Existing Conditions.** The Norfolk Harbor project consists of a network of federally improved and maintained channels extending from the Atlantic Ocean, through the Chesapeake Bay, and into Norfolk Harbor and Newport News (Figure 3).

**Figure 3. Norfolk Harbor federal navigation channels.**



Table 1 presents the existing dimensions for the harbor channels as maintained by the U.S. Army Engineer District, Norfolk (CENAO).

**Table 1. Present channel dimensions in Norfolk Harbor.**

Channel Segment	Depth, ft	Width, ft	Length, Mi
Atlantic Ocean Channel	-52	1,300	10.0
Thimble Shoal Channel	-50	1,000	13.0
Norfolk Harbor Entrance Reach	-50	1,000 to 1,440	2.0
Norfolk Harbor Reach	-50	850-1,250	4.0
Craney Island Reach	-50	800	3.0
Newport News Channel	-50	800	5.4

Note that as is typical with simulator studies, anchorage areas were not part of the Norfolk Harbor Simulator Study and are not included in this report.

Norfolk Harbor has some unique features that influenced the scope for the simulation testing program. These features are as follows:

1. First, most ships entering most U.S. ports are boarded by the harbor pilots at the sea buoy. This allows the pilot to be in control of the ship before it enters the maintained federal channels. However, Norfolk Harbor has two sea buoys. The first is the Chesapeake Bay buoy located near the east end of the Atlantic Ocean Channel (AOC). (Figure 4). The second is the Cape Henry (CH) Buoy located between the west end of the AOC and the east end of Thimble Shoal Channel (TSC). Ships calling at the Port of Norfolk are typically boarded by a member of the Virginia Pilot Association at the pilot boarding area located near the CH Buoy. This means that the ship's captain, or his designee, cons the ship through the AOC without a state pilot on board. The state pilots also disembark the outbound ships near the CH Buoy.
2. Second, there are two areas of naturally deep water located within the harbor area (Figure 4). The first is in the pilot boarding area (Figure 4). The second is in the Norfolk Harbor Entrance Reach (NHER), east of the Hampton Roads Bridge Tunnel (Figure 5).
3. Access to the containership docks, NIT North, NIT South, and VIG is provided by private navigation channels. The access channels between the Norfolk Harbor Reach and NIT North and South are shown highlighted in yellow (Figure 6). The access channel between Craney Island Reach and VIG is shown highlighted in yellow (Figure 7). Because these access channels are privately owned and maintained, they were not included in the Preconstruction Engineering Design (PED) simulation study. However, Moffat & Nichol (M&N) evaluated the access channels with separate simulation studies. The M&N evaluations included recent improvements to the NIT South access channel that are not reflected on the navigation chart shown in Figure 6.

Figure 4. Pilot boarding area.

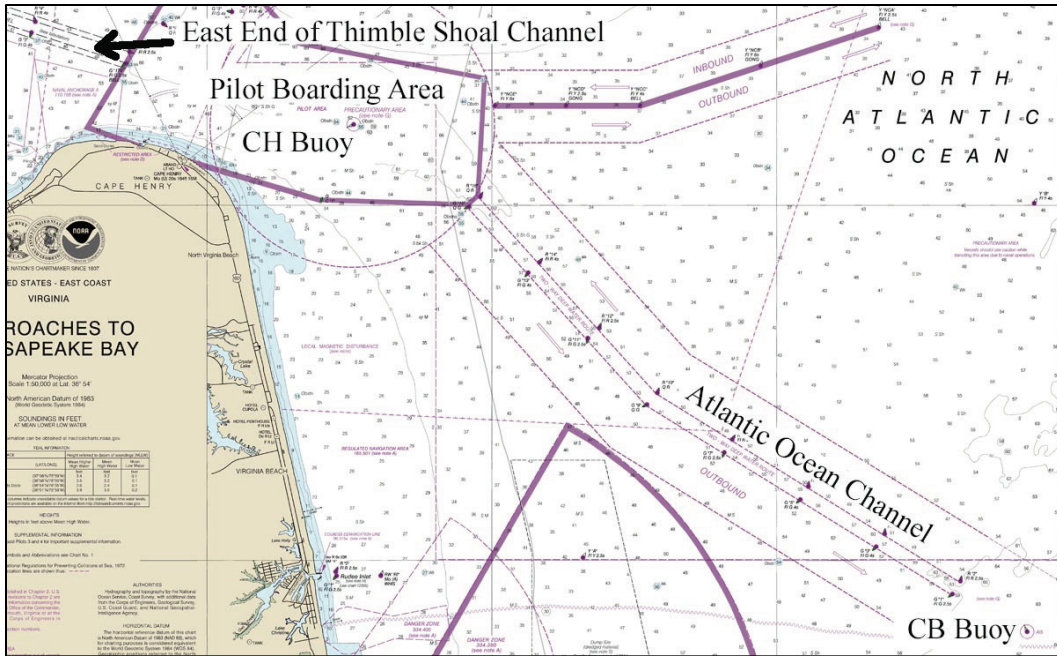


Figure 5. Norfolk Harbor Entrance reach, naturally deep water.

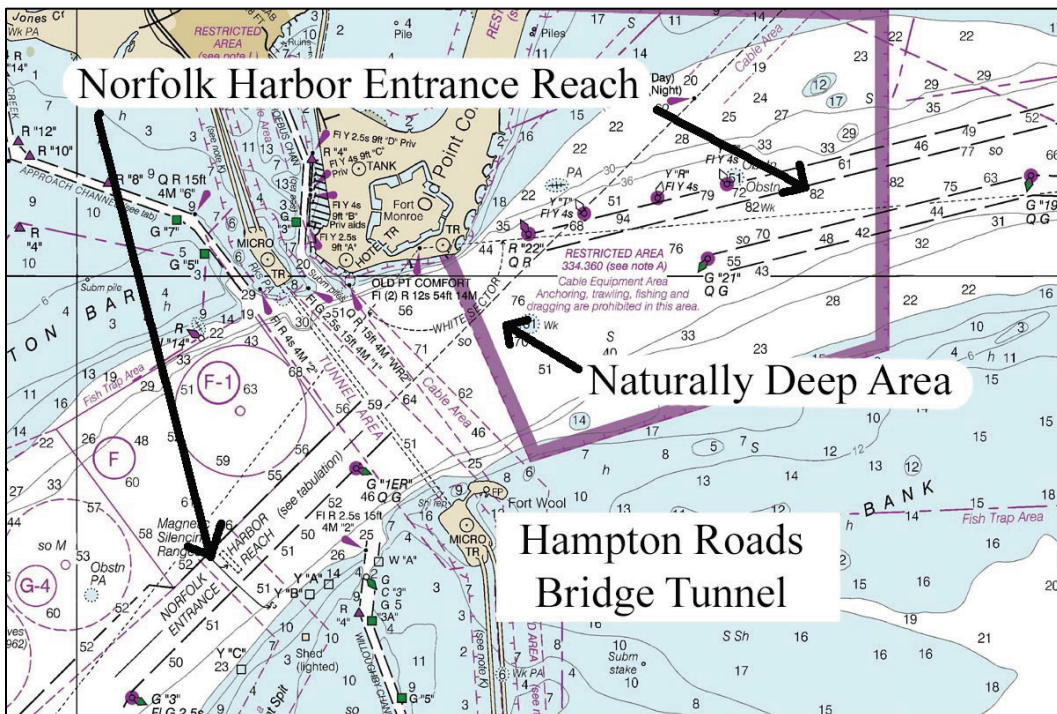


Figure 6. Access channels for NIT docks.

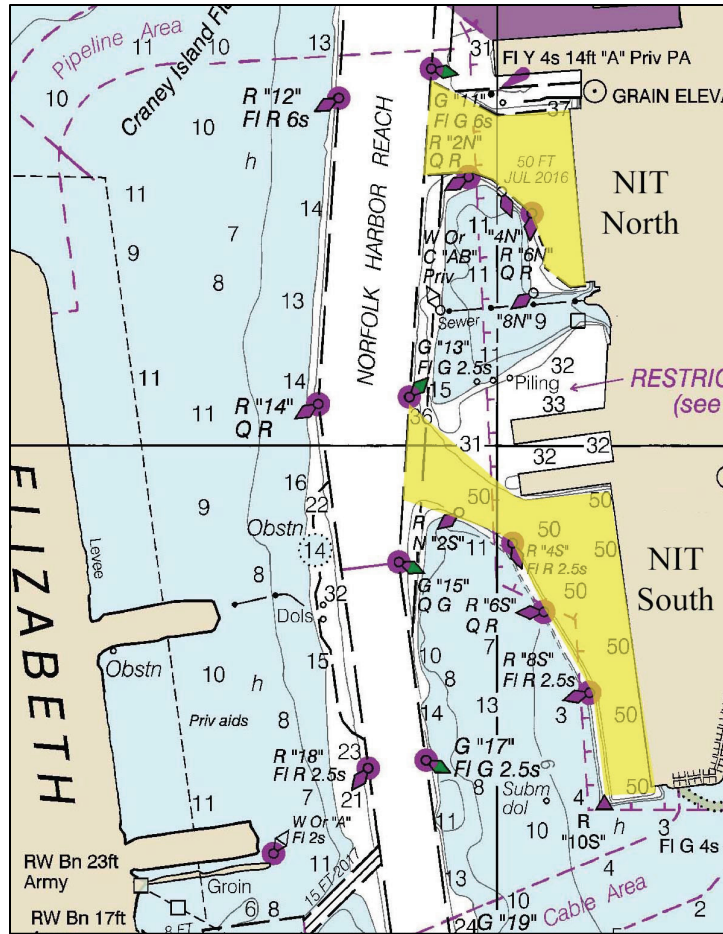
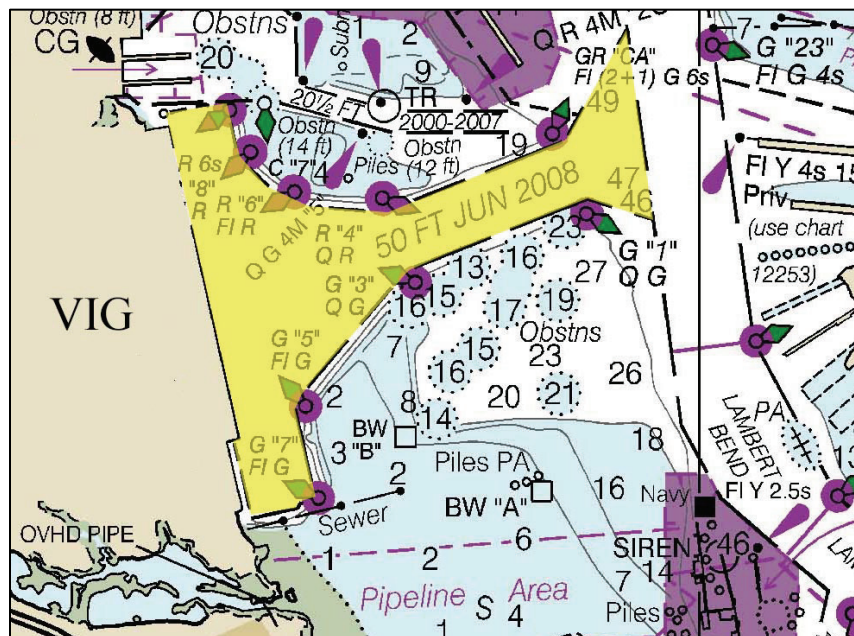


Figure 7. Access channel for VIG.



**Proposed Channel Improvements.** Deepening and widening improvements have been proposed for Norfolk Harbor to achieve the following:

1. Reduce cargo transportation costs for the existing and future fleet at Norfolk Harbor by allowing the vessels to call at a deeper draft.
2. Reduce navigation operational constraints caused by one-way traffic in certain reaches for both the existing and future commercial and Department of Defense fleet over the period of analysis at Norfolk Harbor. The most critical existing constraint is the requirement for one-way only transits of TSC for containerhips longer than 1,150 feet (ft) and with a beam greater than 150 ft (USACE NAO VPA 2018). In addition, coal colliers drafting greater than 48.5 ft must time their departure to arrive at the AOC at high tide to avoid potential grounding due to squat and wave-induced vertical motion.

To address these requirements, numerous channel improvements were studied during the Feasibility portion of the study. The Preferred Alternative (also referred to as the Action Plan or Recommended Plan) was presented in the General Reevaluation Report (GRR) (USACE NAO VPA 2018). The GRR was conducted under Section 216 of the Flood Control Act of 1970 (Public Law 91-611), which authorizes the review of completed projects in the interest of navigation and related purposes to determine the feasibility of further port deepening. The Preferred Alternative is the National Economic Development (NED) Plan, which includes the following:

1. Deepening of Atlantic Ocean Channel to a required depth -59 ft.
2. Deepening of Thimble Shoal Channel to a required depth -56 ft.
3. Deepening the Norfolk Harbor Channel to a required depth -55 ft.
4. Deepening the Norfolk Harbor Entrance Channel to a required depth -55 ft.
5. Deepening of the Newport News Channel to a required depth -55 ft.
6. Widening of the Thimble Shoal Channel east of the Chesapeake Bay Bridge Tunnel to 1,300 ft.

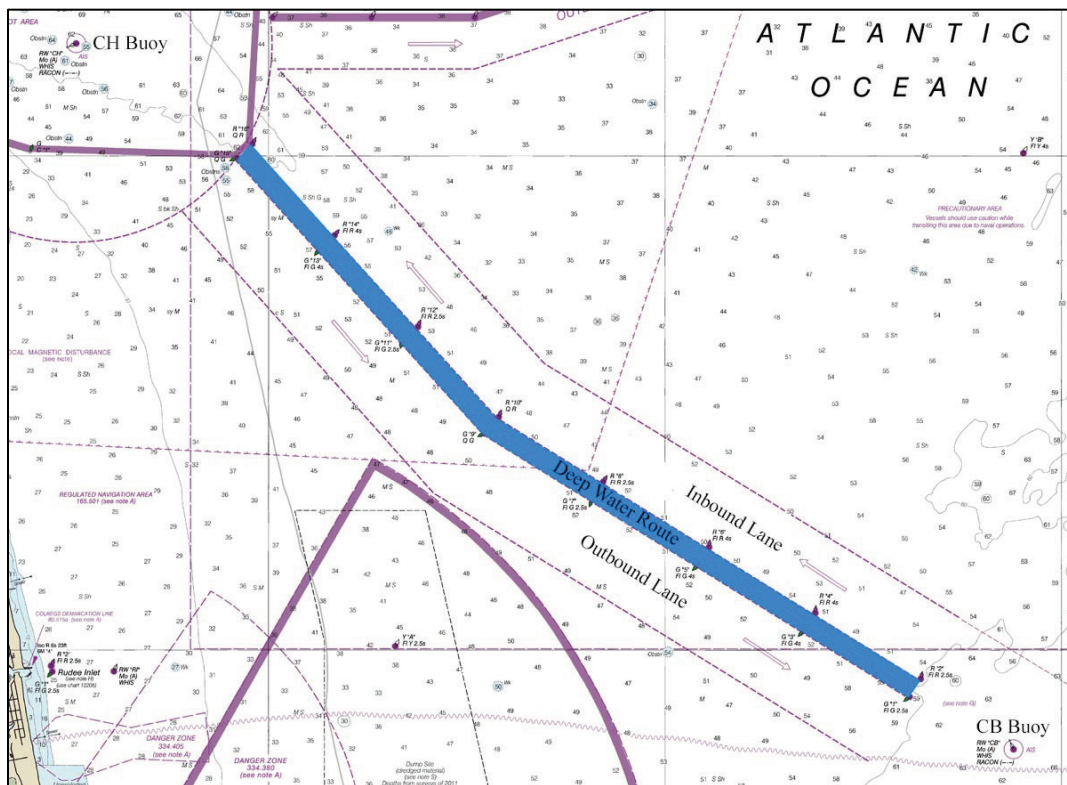
Due to vertical motion and other engineering considerations, outer channels (AOC and TSC) require depths greater than the reference depth set by the inner channels. Channel depth requirements were determined by conducting a Channel Analysis and Design Evaluation Tool modeling study (USACE NAO VPA 2018).

Additional explanation of the AOC and TSC reaches of Norfolk Harbor and the proposed improvements for those reaches follows.

### Atlantic Ocean Channel (AOC)

The AOC is a 1300 ft wide Deep Water Route with shallower inbound and outbound lanes on either side (Figure 8). The AOC is used by vessels drafting 45 ft or greater. The U.S. Navy also requires that aircraft carriers (drafts 38 ft – 40 ft) use the AOC. As previously stated, the pilots typically board and disembark the ship at the CH Buoy. The pilots typically take aircraft carriers through the AOC. Otherwise, the state pilots only take the vessels through the AOC if requested by the ship's master.

Figure 8. AOC.

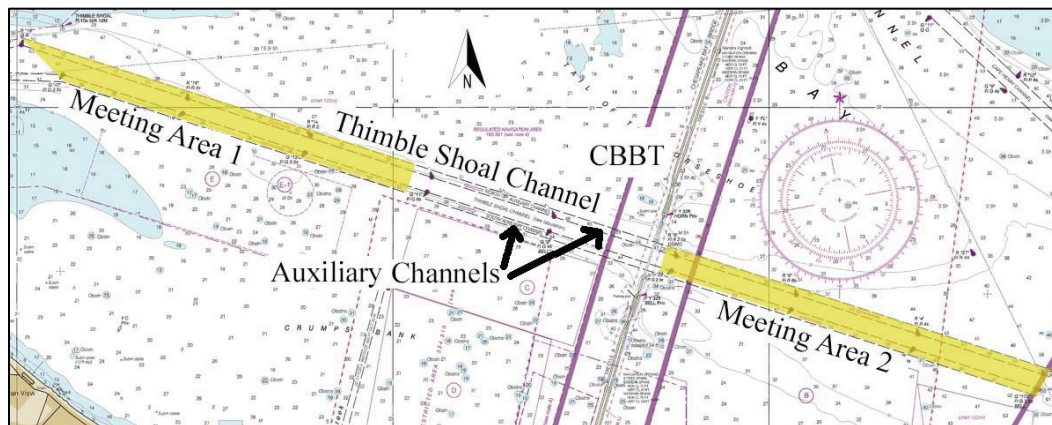


Depths greater than 60 ft are common just southeast and northwest of the portion of existing 52 ft deep AOC (Figure 7). When the AOC is deepened to 59 ft, it is unlikely that the channel shown on the chart will be extended.

### Thimble Shoal Channel (TSC)

The TSC is presently 1,000 ft wide and 50 ft deep (Figure 9). It has two adjacent north and south auxiliary channels. The auxiliary channels are presently 450 ft wide with an authorized depth of 32 ft but are not maintained.

Figure 9. Thimble Shoal Channel and approximate limits of Meeting Areas 1 and 2.



Two meeting areas were evaluated during a feasibility screening simulator study conducted by the U.S. Army Engineer Research and Development Center (ERDC) in February 2017. The two areas, Meeting Areas 1 and 2, are identified in Figure 9. The simulator study was conducted using large containerships sized close to this study's design vessels. The ERDC study recommended a minimum width of 1,200 ft and a maximum width of 1,400 ft for the design ships to meet. This recommendation was given for both meeting areas, with the caveat that Meeting Area 2 could possibly be reduced to 1,300 ft. The reduction might be possible because the water immediately north and south of Meeting Area 2 is deeper. The deeper water results in decreased bank effects upon passing ships.

Meeting Area 2, east of the Chesapeake Bay Bridge Tunnel (CBBT), at a width of 1,300 ft, was selected for the NED plan. Within this segment, TSC will be widened 150 ft on each side to establish a total width of 1,300 ft. A commensurate widening of the auxiliary channels is not proposed. This channel improvement was included with the simulation modeling conducted for this PED effort. Meeting Area 1 was not selected for the NED plan, and simulation modeling results are excluded from this report.

## Approach

**Real-time ship simulation study.** To assist the CENAO and the VPA, a real-time ship simulator study was conducted at the Maritime Institute of Technical and Graduate Studies (MITAGS). This study was used to evaluate the effectiveness of the NED plan. The MITAGS facility is located in Linthicum, MD. The ship simulation study was conducted by M&N with assistance from Webb Simulation Consulting. ERDC provided oversight and review prior to and during the simulations. ERDC also assisted during data processing, review of simulation results, and technical report authoring. A detailed description of the approach is presented in Chapter 2.

This report was furnished in draft form to M&N, VPA, CENAO, David Miller and Associates, and the VPA for their review and concurrence. The VPA Colonel documented concurrence with a letter to CENAO dated 5 March 2019. That letter is included in Appendix A.

## 2 Data Development

### Simulator description

The MITAGS training center offers two Full-Mission Shiphandling Simulators [SHS #1 and SHS #2], four Bridge Tug Simulators, and six Part-Task Simulators (Moffatt & Nichol 2018). The simulators are built on the Transas Navi-Trainer Profession (NTPro) 5000 platform, Version 5.35. The simulation facility is certified by Det Norske Veritas. A more detailed description of the facility is available in the referenced Moffatt & Nichol NHC Simulation Plan.

SHS #1 and SHS #2 are Full-Mission Shiphandling Simulators that are housed within 360° curved projection screens that measure 80 ft in diameter and 30 ft in height. SHS #3, SHS #5, and SHS #6 are Full-Mission Bridge Tug Simulators that utilize a 300° horizontal field of view and 42° vertical field of view. SHS #4 is a Bridge Tug Simulator that offers 120° of visuals and the ability to change the view to any location. The six Part-Task Simulators have the same model hydrodynamic fidelity as the Full-Mission Bridge but have reduced visual acuity (single video channel). The Full-Mission Bridge Simulators, Tug Bridge Simulators, and the Part-Task Simulators can be integrated into the same gaming area to allow up to 12 interactive ownships in one exercise.

### Required data

For this study, data required included channel geometry, currents, bathymetry, wind, wave, and visual data of the physical scene comprising the study area. All simulation scenarios, described by location, initial ship conditions, wind speed, current, and availability of tugs were developed in conjunction with the pilots and approved by both ERDC and CENAO prior to simulation. When conducting U.S. Army Corps of Engineers (USACE) simulator studies, conditions are typically chosen to represent severe conditions. The pilots indicated that, while the conditions simulated were severe, they have encountered more difficult conditions in real life. However, the pilots also indicated the simulator provided an adequate experience to support their evaluation of the design.

**Channel geometry.** The navigation channel footprints for existing and proposed future conditions were furnished by CENAO as a computer aided

design and drafting (CADD) file in the State Plane Virginia South, North American Datum of 1983 coordinate system.

**Currents.** Currents for existing and proposed future conditions were furnished by the Virginia Institute of Marine Science (VIMS). The currents were calculated using a Semi-implicit Cross-scale Hydroscience Integrated System Model (SCHISM) model of the lower Chesapeake. The SCHISM model was approved by the ERDC Navigation Technical Director, for Norfolk Harbor Deepening. This model provides a comprehensive simulation of currents throughout the project area and was calibrated based on National Oceanic and Atmospheric Administration (NOAA) data.

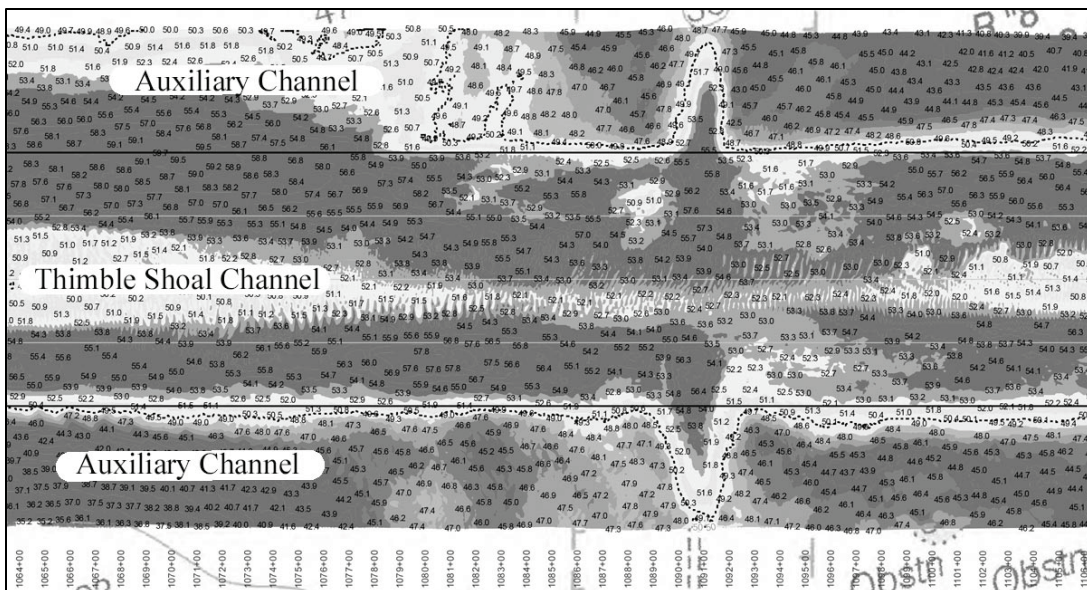
M&N prepared a memorandum documenting VIMS analysis of the sensitivity of the SCHISM model to grid resolution. This memorandum is included in Appendix B.

**Bathymetry.** Bathymetry was obtained from the USACE Hydrographic Surveys web site:

<https://www.arcgis.com/apps/opsdashboard/index.html#/4b8f2ba307684cf597617bf1b6d2f85d>

A sample from an April 2018 survey showing the high resolution of the data is shown below (Figure 10). The depths, given in mean lower low water are for TSC and its auxiliary channels.

Figure 10. USACE bathymetry for TSC and auxiliary channels.



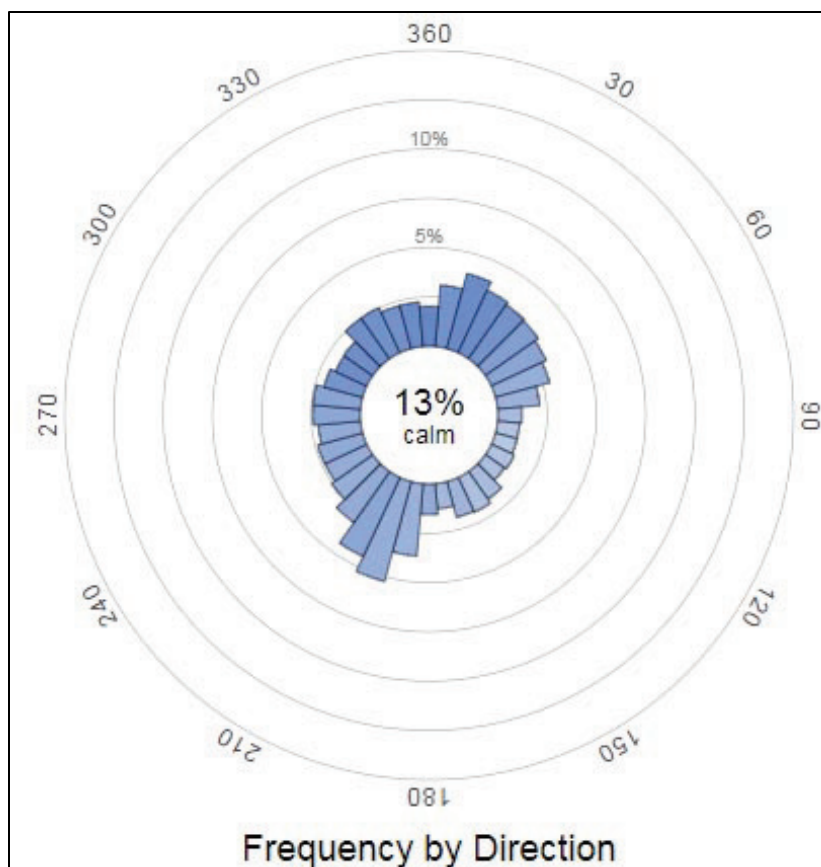
**Wind.** Steady winds were used for the simulation program. Wind magnitudes and directions were based upon pilot input and verified by the wind rose at the Norfolk Naval Air Station (Figure 11).

**Waves.** The model database will support a spectral representation (e.g., Jonswap) of a time-varying wave field into the model. This will include the capability to model bidirectional swell and sea concurrently. Waves with a height of 1 meter (m) and a 10-second (sec) period coincident with the wind were used for the four Atlantic Ocean Channel scenarios. Typically, swell is not included in simulations of interior, which are protected. Wind-generated waves were implemented for all scenarios but not anticipated to influence the design ships.

**Visual data.** The Norfolk visual scene and radar databases existed at MITAGS prior to this study and had previously been used for pilot training.

**Data checkout.** The databases were checked prior to the simulation study by representatives of MITAGS and Webb Simulation Consulting. The data were geometrically correct, and all databases overlaid properly. Screenshots of data checkout were presented to ERDC.

Figure 11. Wind rose, Norfolk Naval Air Station.



## Design ships

Two design ships were used during the PED simulation study, an ultra-large container vessel (ULCV) and a large bulker or coal collier. The ship specifications are shown below (Table 2). Both ships are even keel, meaning that the draft is the same along the length of the ship. This is generally regarded as more difficult than a ship that is trimmed (the bow and stern loaded to different drafts). In addition, the economic studies were based upon fully loaded ships. The pilot cards for each vessel are included (Tables 3 and 4).

Table 2. Design ships for Norfolk study.

Ship	Length over All	Beam	Draft	Dead Weight Tons	Twenty-Foot Equivalent Unit
ULCV	1201 ft 366.1 m	168 ft 51.2 m	49.0 ft 14.9 m	163,239	~14,000
Bulker	985 ft 300.2 m	164 ft 50.0 m	51.1 ft 15.6 m	210,000	N/A

Note the draft of the bulker in Table 2 is 51.1 ft (or 51 ft, 1 inch [in.]). The draft of the bulker in Table 4 is 50 ft, 11 in. The discrepancy was caused by truncation during MITAGS ship model development process. The 2 in. difference in draft has negligible impacts upon the study results. ERDC typically considers channel deepening of up to 2 ft exempt from simulation because an additional 2 ft of draft will not change ship response enough to warrant simulation. This assumes that the draft increase is the vessels do not increase in length or beam and maintain the same operational parameters.

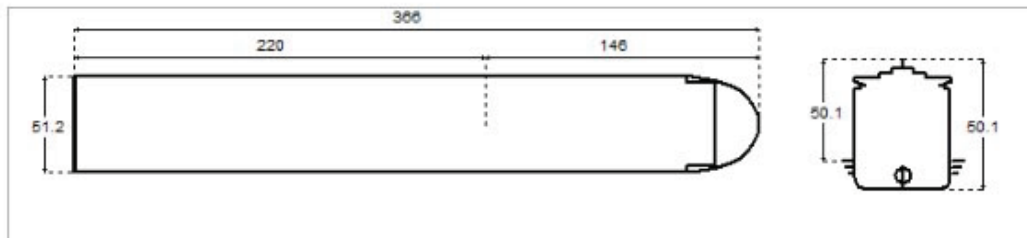
Both design ships presently call at Norfolk Harbor but are not able to call fully loaded due to channel depth restrictions.

Table 3. Pilot card for ULCV, MV *Kalina*.

Ship name	Container Kalina_Norfolk 3.0.51.2 *		Date	03.10.2018	
IMO Number	N/A	Call Sign	N/A	Year built	1995
Load Condition	Loaded				
Displacement	198160 tons	Draft forward	14.9 m / 49 ft 0 in		
Deadweight	135460 tons	Draft forward extreme	14.9 m / 49 ft 0 in		
Capacity		Draft after	14.9 m / 49 ft 0 in		
Air draft	50.1 m / 164 ft 9 in	Draft after extreme	14.9 m / 49 ft 0 in		

## Ship's Particulars

Length overall	366 m	Type of bow	Bulbous
Breadth	51.2 m	Type of stern	Transom
Anchor(s) (No./types)	2 ( PortBow / StbdBow )		
No. of shackles	14 / 14	(1 shackle =27.5 m / 15 fathoms)	
Max. rate of heaving, m/min	15 / 15		



## Steering characteristics

Steering device(s) (type/No.)	Semisuspended / 1	Number of bow thrusters	2
Maximum angle	35	Power	1700 kW / 1700 kW
Rudder angle for neutral effect	0.2 degrees	Number of stern thrusters	N/A
Hard over to over(2 pumps)	22 seconds	Power	N/A
Flanking Rudder(s)	0	Auxiliary Steering Device(s)	N/A

## Stopping

## Turning circle

Description	Full Time	Head reach	Ordered Engine: 100%, Ordered rudder: 35 degrees	
FAH to FAS	475.6 s	9.97 cbcls	Advance	5.6 cbcls
HAH to HAS	555.6 s	9.39 cbcls	Transfer	2.07 cbcls
SAH to SAS	668.6 s	9.44 cbcls	Tactical diameter	5.11 cbcls

## Main Engine(s)

Type of Main Engine	Low speed diesel	Number of propellers	1
Number of Main Engine(s)	1	Propeller rotation	Right
Maximum power per shaft	1 x 73340 kW	Propeller type	FPP
Astern power	82 % ahead	Min. RPM	21
Time limit astern	N/A	Emergency FAH to FAS	26.2 seconds

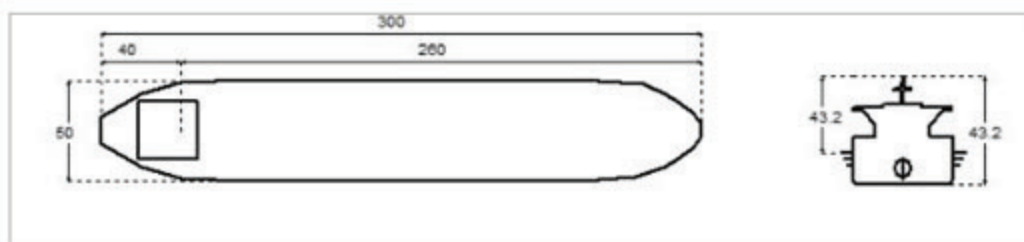
## Engine Telegraph Table

Engine Order	Speed, knots	Engine power, kW	RPM	Pitch ratio
"FSAH"	23.7	67444	99.9	1.03
"FAH"	16.8	23214	70	1.03
"HAH"	13.6	11310	55.1	1.03
"SAH"	11.4	6236	45.2	1.03
"DSAH"	7.6	1536	28.2	1.03
"DSAS"	-3	1855	-28	1.03
"SAS"	-4.8	7585	-45	1.03
"HAS"	-5.8	13797	-55	1.03
"FAS"	-6.9	22712	-65	1.03
"FSAS"	-9.3	60143	-90	1.03

Table 4. Pilot card for coal collier, MV bulker *Zhong Xing Hai*.

Ship name	Bulk Zhong Xing Hai	3.0.27.0 *	Date	03.10.2018	
IMO Number	N/A	Call Sign	N/A	Year built	2011
Load Condition	Partial Loaded_2				
Displacement	210810 tons	Draft forward	15.5 m / 50 ft 11 in		
Deadweight	84900 tons	Draft forward extreme	15.5 m / 50 ft 11 in		
Capacity		Draft after	15.5 m / 50 ft 11 in		
Air draft	43.2 m / 142 ft 1 in	Draft after extreme	15.5 m / 50 ft 11 in		

Length overall	300 m	Type of bow	Bulbous
Breadth	50 m	Type of stern	V-shaped
Anchor(s) (No./types)	2 ( PortBow / StbdBow )		
No. of shackles	15 / 14	(1 shackle =25 m / 13.7 fathoms)	
Max. rate of heaving, m/min	9 / 9		



Steering device(s) (type/No.)	Semisuspended / 1	Number of bow thrusters	N/A
Maximum angle	35	Power	N/A
Rudder angle for neutral effect	0.39 degrees	Number of stern thrusters	N/A
Hard over to over(2 pumps)	26 seconds	Power	N/A
Flanking Rudder(s)	0	Auxiliary Steering Device(s)	N/A

Stopping			Turning circle	
Description	Full Time	Head reach	Ordered Engine: 100%, Ordered rudder: 35 degrees	
FAH to FAS	749.6 s	10.87 cbls	Advance	4.86 cbls
HAH to HAS	857.6 s	10.22 cbls	Transfer	2.05 cbls
SAH to SAS	1196.3 s	9.84 cbls	Tactical diameter	5.08 cbls

Type of Main Engine	Low speed diesel	Number of propellers	1
Number of Main Engine(s)	1	Propeller rotation	Right
Maximum power per shaft	1 x 17950 kW	Propeller type	FPP
Astern power	76 % ahead	Min. RPM	22
Time limit astern	N/A	Emergency FAH to FAS	33.2 seconds

Engine Order	Speed, knots	Engine power, kW	RPM	Pitch ratio
"100%"	13.8	16155	73	1.05
"80%"	12.1	12490	67	1.05
"60%"	9.7	7691	57	1.05
"40%"	6.6	2658	40	1.05
"20%"	4.5	912	28	1.05
"-20%"	-1.8	996	-28	1.05
"-40%"	-2.6	2903	-40	1.05
"-60%"	-3.7	8400	-57	1.05
"-80%"	-4.3	13642	-67	1.05

### 3 Navigation Study

Real-time simulations were conducted during October and November of 2018. Table 5 lists the visitors for the entire simulation program.

Table 5. Simulation operator, October – November 2018.

Name	Date	Affiliation	Session	Purpose
Capt. Whiting Chisman	8-9 OCT 17-18 OCT 22-26 OCT 7 NOV	Virginia Pilots	Validation Testing 1 Testing 2 Testing 3	Harbor Pilot
Capt. Chad Jamison	8-9 OCT 15-19 OCT	Virginia Pilots	Validation Testing 1	Harbor Pilot
Capt. Keith Hope	15-19 OCT	Virginia Pilots	Testing 1	Harbor Pilot
Capt. David Ware	22-26 OCT	Virginia Pilots	Testing 2	Harbor Pilot
Capt. Jacob Johnson	5 - 9 NOV	Virginia Pilots	Testing 3	Harbor Pilot
Capt. Waightstill Avery	5 - 9 NOV	Virginia Pilots	Testing 3	Harbor Pilot
Capt. Larry Bergin	8-9 OCT 15-19 OCT 22-26 OCT 5 - 9 NOV	MITAGS	Virginia Pilots Testing 1 Testing 2 Testing 2	Master Mariner
Mr. Mario Sanchez	23 - 24 OCT	ERDC	Testing 2	Observer
Mr. Tim Shelton	5 - 7 NOV	ERDC	Testing 3	Observer
Mr. Zac Canody	7 NOV	VPA	Testing 3	Observer

#### Validation

Validation was conducted on 8-9 October 2018. During validation, repeated runs were made through the existing condition simulation databases. These databases were adjusted until existing conditions were reproduced. The same adjustments were carried forward to the databases for the alternative improvements. The following parameters were verified and re-calibrated during validation:

- Ship-to-ship interaction
- Wind effects
- Bank conditions
- Ship engine and rudder response
- Waves and currents

- Visual scene and radar image for the entire study area
  - Location of all aids to navigation
  - Location and orientation of the docks
  - Location of buildings visible from the vessel.

Note that the pilots were not completely satisfied with the vessel response during validation. This was mainly for the interaction between multiple ships and their response to banks during the meeting scenarios. This is not uncommon for validation of two-way traffic simulations. The hydrodynamic modeling of ship-to-ship interaction is extremely complex. However, the pilots indicated that the two-way traffic modeling was still useful as a tool to assist them in the evaluation of the widening's effectiveness. The pilots were able to accomplish this by extrapolating their simulator experiences to their experience with a wide range of real-world conditions.

## Testing procedure

To completely analyze the proposed channels, appropriate combinations of heading, currents, wind and waves were simulated using both design ships.

Prior to conducting the simulations, the test matrix was presented to and approved by ERDC and CENAO. In addition to combinations of wind and currents, a low-visibility condition was added. This was done in response to extreme fog observed by ERDC personnel during their reconnaissance visit. That test matrix is shown in Table 6. Note that the test matrix included in the simulation plan was subject to change based upon observations and information received during validation and testing. A full description of the runs tested is included in the result analysis for each channel section simulated.

The deepening portion of the improvements was evaluated with one-way simulations of the entire project.

Numerous simulations were conducted to evaluate the effectiveness of the 1,300 ft wide Meeting Area 2 in the TSC. All exercises were two-way, with one ship meeting a convoy of two ships within the proposed Meeting Area 2. Multiple ship convoys occur regularly in the TSC. They were also included in the ERDC 2017 screening program as part of the credible worst-case scenario. All three ships were piloted, during the actual meeting, by a member of the Virginia Pilot Association. This was

accomplished by utilizing two members of the Virginia Pilot Association and one Master Mariner. In the case of one inbound ship meeting two outbound ships, the simulation was accomplished as follows:

1. The inbound ship was conned by a VPA pilot for the duration of the exercise.
2. The first outbound ship was conned by a VPA pilot until the meeting was completed. At that time, the simulation of outbound ownship 1 was terminated.
3. The second outbound ship was conned by a Master Mariner as that ship follows the first outbound ship at an appropriate distance. Once the first meeting was completed, the VA pilot transferred to the bridge of the second outbound ship and took the con from the Master Mariner.

Conducting the exercises in this manner required the inbound mariner to meet the first outbound ship, regain proper alignment, meet the second outbound ship, and finally recover for the duration of the inbound transit. This methodology allowed for complete simulation with each ship being conned by an experienced VPA pilot while maintaining efficiency of the simulation effort. This methodology was also applied to a single outbound ship meeting two inbound vessels.

Table 6. Draft PED simulation matrix.

Table 6: Draft PED Simulation Matrix

Run No.	Purpose / Area of Study	Piloted Vessel 1	Passing Vessel 2	Passing Vessel 3	Channel Layout	Vessel 1 Start	Direction of Transit	Vessel 2 Start	End	Current	Wind	Wave	Offshore Swell
1	Inbound Full Transit	14k TEU			PED	“CH” Buoy	Inbound		VIG	Flood	NE 25 kts	TBD	TBD
2	Inbound Full Transit	14k TEU			PED	“CH” Buoy	Inbound		VIG	Ebb	SW 25 kts	TBD	TBD
3	Outbound Transit	14k TEU			PED	VIG	Outbound		CBBT	Flood	NE 25 kts	TBD	TBD
4	Outbound Transit	14k TEU			PED	VIG	Outbound		CBBT	Ebb	SW 25 kts	TBD	TBD
5	Meeting Area #2	14k TEU	14k TEU	14k TEU	PED	Buoy R "2"	Inbound	G "5"	R "6"	Flood	S 25 kts	TBD	TBD
6	Meeting Area #2	14k TEU	14k TEU	14k TEU	PED	Buoy R "2"	Inbound	G "5"	R "6"	Ebb	S 25 kts	TBD	TBD
7	Meeting Area #2	14k TEU	14k TEU	14k TEU	PED	Buoy G "5"	Outbound	R "2"	R "2"	Flood	N 25 kts	TBD	TBD
8	Meeting Area #2	14k TEU	14k TEU	14k TEU	PED	Buoy G "5"	Outbound	R "2"	R "2"	Ebb	N 25 kts	TBD	TBD
9	Meeting Area #2	14k TEU	Coal Collier	Coal Collier	PED	Buoy R "2"	Inbound	G "5"	R "8"	High Slack	N 25 kts	TBD	TBD
10	Meeting Area #2	14k TEU	14k TEU	14k TEU	PED	Buoy R "2"	Inbound	G "5"	R "6"	Flood	S 10 kts	TBD	TBD
11	Outbound Transit	Coal Collier			PED	Norfolk	Outbound		CBBT	High Slack	N 25 kts	TBD	TBD
12	Outbound Transit	Coal Collier			PED	Newport News	Outbound		CBBT	High Slack	N 25 kts	TBD	TBD
13	AOC – Inbound*	14k TEU			PED	“CB” Buoy	Inbound		“CH” Buoy	Flood	NE 25 kts	TBD	TBD
14	AOC – Inbound*	14k TEU			PED	“CB” Buoy	Inbound		“CH” Buoy	Ebb	SW 25 kts	TBD	TBD
15	AOC – Outbound*	14k TEU			PED	“CH” Buoy	Outbound		“CB” Buoy	Ebb	SW 25 kts	TBD	TBD
16	AOC – Outbound	Coal Collier			PED	“CH” Buoy	Outbound		“CB” Buoy	High Slack	N 25 kts	TBD	TBD



## 4 Results

Results are presented in the form of track plots (Appendix C), final pilot questionnaires (Appendix D), and pilot comment sheets filled out after each exercise (Appendix E). Results of the AOC simulations will be presented first followed by the one-way runs for both the ULCV and the bulker. Last, the two-way simulations for the TSC will be analyzed.

Ship simulation results for channel design tends to be fairly subjective. The evaluation of navigation simulation results typically consists of track plots, evaluation questionnaires, and observations that are recorded after each simulation exercise run. Simulator studies rely heavily on the experience of the mariners. Therefore, the introduction of human judgement and execution into the study makes defining exact criteria for technical evaluation difficult.

With respect to exact data collected during a simulation exercise, the ship's position and heading are post-processed into track plots which are input into computer-aided-drawing software. This allows for the examination of individual and composite runs and querying of distances between ships and important impedances to free navigation such as the channel edge, other ships, and any other objects present in the environment.

Compared to a full matrix of statistically reliable experimental design, ship simulation studies conduct a somewhat limited number of exercises. This is due to time and budget constraints as well as the availability of mariners to con the simulated vessels. That is why simulation conditions are typically limited to more severe conditions. These scenarios include combinations of wind and current under which the port would expect to be able to operate. This is the standard of practice for maximum conservative evaluation and how all the scenarios in this study were developed for the combinations of wind speed and direction, current, tug usage, and docked ships. When subject matter experts undertake the process of evaluating results, it is imperative to recognize that the data being evaluated are based on a limited number of exercises. These exercises are conducted under post-project conditions. This involves deeper-drafted ships than presently call at Norfolk and meeting ships larger than the present restriction for two-way traffic. Pilots are also operating with a visual scene

that is a two-dimensional representation of the three-dimensional world, which can affect results. All of these variables come into play in navigation simulation studies and necessitate that simulation reports are provided in draft form for review by all the project stakeholders.

## AOC exercises

Track plots for the AOC are shown in Plates 1 – 4. For reasons previously discussed, these runs were undertaken with a master mariner, rather than a harbor pilot, conning the ship. Four runs were conducted, two inbound and two outbound. It was determined that one master mariner would be sufficient to properly test the AOC improvements. Transiting the AOC is regarded as fairly straight forward as evidenced by the fact that the Virginia pilots are usually not onboard at that time.

The track plot for the *Kalina's* inbound transit through AOC during flood tide is shown in Plate 1. The wind was 25 knots from the northeast. In addition to the wind-induced waves, a wave surge with a height of 1 m with a 10 sec period from the northeast was included in the scenario. This scenario is number 159 in the MITAGS run number system. The ship remained near the centerline for most of the transit. Between buoys G “9” and G “11,” the vessel came to approximately 185 ft of the south edge of the channel.

The track plot for the *Kalina's* inbound transit through AOC during ebb tide is shown in Plate 2. This is run number 160. The wind was 25 knots from the southwest. In addition to the wind-induced waves, a wave surge with a height of 1 m with a 10 sec period from the southwest was included in the scenario. The ship remained near the centerline for most of the transit. The ship did not come closer than 300 ft to the channel edge at any point during the transit.

The *Kalina's* outbound run with ebb tide and 25 knots of wind from the southwest (Run 161) is presented as a track plot in Plate 3. The wave surge was from the southwest with a height of 1 m with a 10 sec period. The ship tended to stay more on the southern part of the channel. The ship came to within approximately 180 ft of the channel between buoys G “11” and G “13” and to within approximately 60 ft of the channel near buoy G “7.”

The track plot of the only bulk carrier run in the AOC is shown in Plate 4 (Run 62). This run was conducted with slack current. The wind was

25 knots from the north. However, the wind will have minimal effect upon the fully loaded collier. The vessel stayed towards the channel centerline throughout the exercise. The ship's track varied less and crabbed less than the containerships. This is probably a reflection of the minimized effect of wind. Containerships, with their cargo loaded on deck, have a much higher wind profile. This results in a larger sail area.

### **Full transits between TSC and the dock**

Full transits of the project area, excluding the AOC because the pilots are not typically onboard, were undertaken. Only the containership was simulated inbound since its cargo is both import and export. The containership was simulated with 49.0 ft draft both inbound and outbound. The coal collier was simulated outbound only since it already transits Norfolk Harbor inbound with a ballast condition. The bulker draft was 50.91 ft for outbound transits. As previously stated, both the ULCV and bulker presently transit the existing channels at a lesser draft.

One transit for each full harbor scenario was completed each week, resulting in three runs of each scenario for the study. Each pilot did not complete the full transit. Both VPA pilots were on the bridge for each of the full harbor simulations, so it became somewhat of a dual effort.

Because the runs are long, the track plots are not only presented on one full track but also are broken down into smaller insets. The insets allow the data to be plotted at a larger scale for improved visibility. Scenarios will be presented in the direction of the transits. Inbound simulations begin near the east end of TSC and progress inward. Outbound simulations begin in the channel, with the ships heading outbound.

The channel lines are shown as dashes on each plate. In areas where no channel line is shown on the NOAA charts, no channel line is shown on the plates. There is naturally deep water in those areas. However, there are areas where there is a defined federal channel with naturally deep water outside the channel limits. It is common practice today for the pilots to take advantage of the naturally deep water, which may extend beyond the defined federal channel. Continued use of these unmaintained areas will need to be reevaluated by the pilots for deeper drafting vessels. During

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<sup>1</sup> As discussed previously, the resultant difference between the simulator and design draft of approximately 2 in. does not alter the conclusions of the effort.

testing for this navigation study, many of the simulation runs between the TSC and the docks made use of the deeper water in the vicinity of the Norfolk Harbor Entrance Channel (NHEC). To assist in evaluating the usage of the ships maneuvering ability during these runs, a separate series of figures were developed in addition to the track plots.

These figures contain data for the NHEC only. They contain the tracks for runs conducted under the same conditions of current and wind. The figures also include plots of rudder angle and engine speed in revolutions per minute (RPM). The track plots are at 30 sec intervals. The rudder and engine data are plotted at 1 sec intervals. The rudder and engine data are plotted versus distance traveled once the ship entered the NHEC. This gives a good comparison of maneuvering required when compared with the position of vessel in the track plot. However, because there is a turn in the NHEC and the ships did not travel in a straight line, it should not be considered as an exact correlation between ship track position and maneuverability.

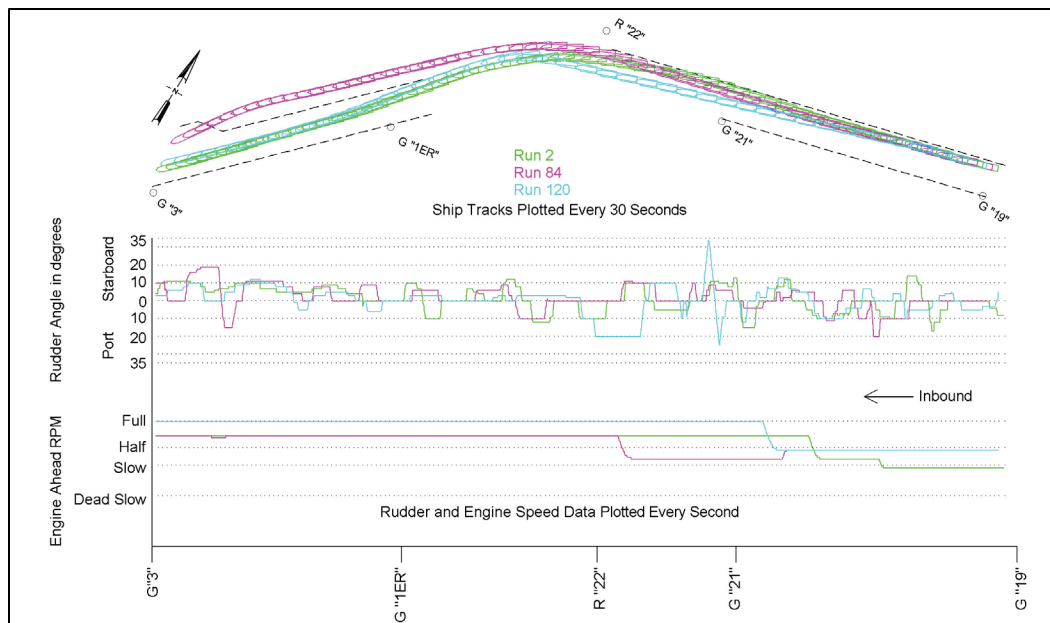
Rudder and engine speed are considered indicators of maneuverability being applied to the ship. The more rudder angle that is applied, the quicker the pilot is trying to get the ship to respond. Note that many pilots apply full rudder angle in short bursts to start the vessel swinging. This is not an indication that full maneuvering ability is being utilized. Engine speed is also a factor since increasing the engine RPM will increase the water flow past the rudder, this increases the rudder's ability to turn the ship. Pilots refer to having to use all their ship's maneuverability as being "hooked up and hard over." Being hooked up and hard over for a sustained period indicates that the pilots have no maneuverability in reserve if it is needed.

### **Inbound *Kalina* scenarios**

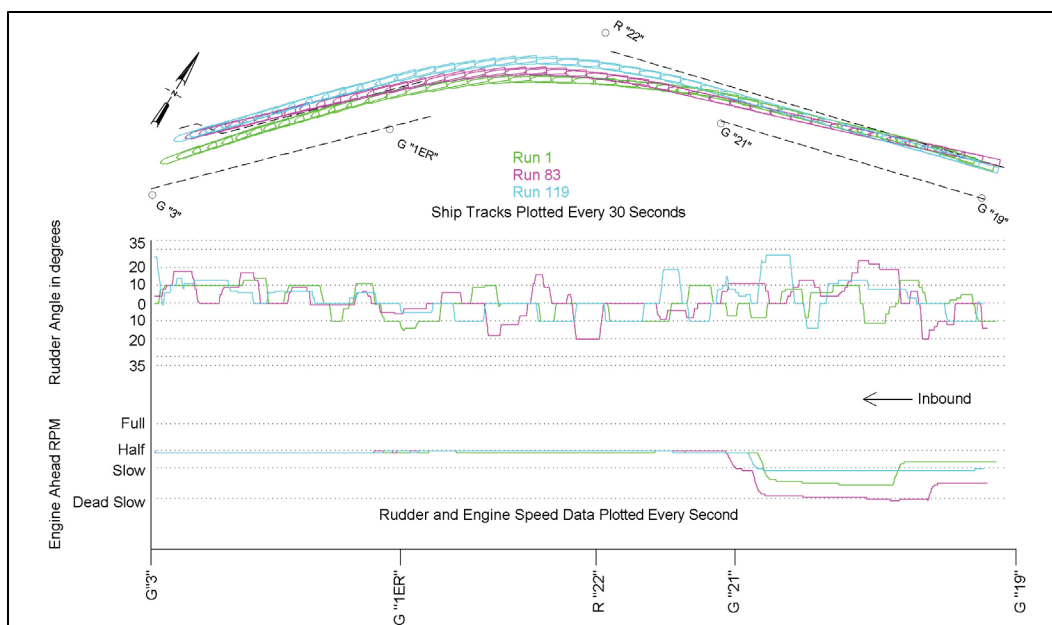
The composite plot of the inbound *Kalina* at ebb tide is shown in Plates 5, 6, 7, 8, and 9. The runs shown in the track plots are numbers 2, 84, and 120. The wind was 25 knots from the southwest. The transits of the TSC are shown in Plates 6 and 7. Plate 8 (Inset 3) contains the passage through NHER. Figure 12 shows the rudder and engine for Runs 2, 84, and 120 NHER. Data for the inbound ship read from right to left. Run 120 was the only ship to use full engine speed or full rudder. Note that the hard-to-starboard rudder was a quick response to stop the ship from turning after an approximately 25 degrees port rudder command. Runs 2 and 84 left the authorized channel to take advantage of deep water. Run 120 did

not leave the authorized channel at any time. Moderate rudder angles and engine speeds indicate the inbound *Kalina*'s transit at ebb tide was well within its full available maneuverability. Plate 9 shows the runs from Inset 3, Norfolk Harbor Reach and Craney Island Reach. The runs in these two reaches were completed without any issues.

Figure 12. Maneuverability plot, inbound *Kalina* with ebb tide.

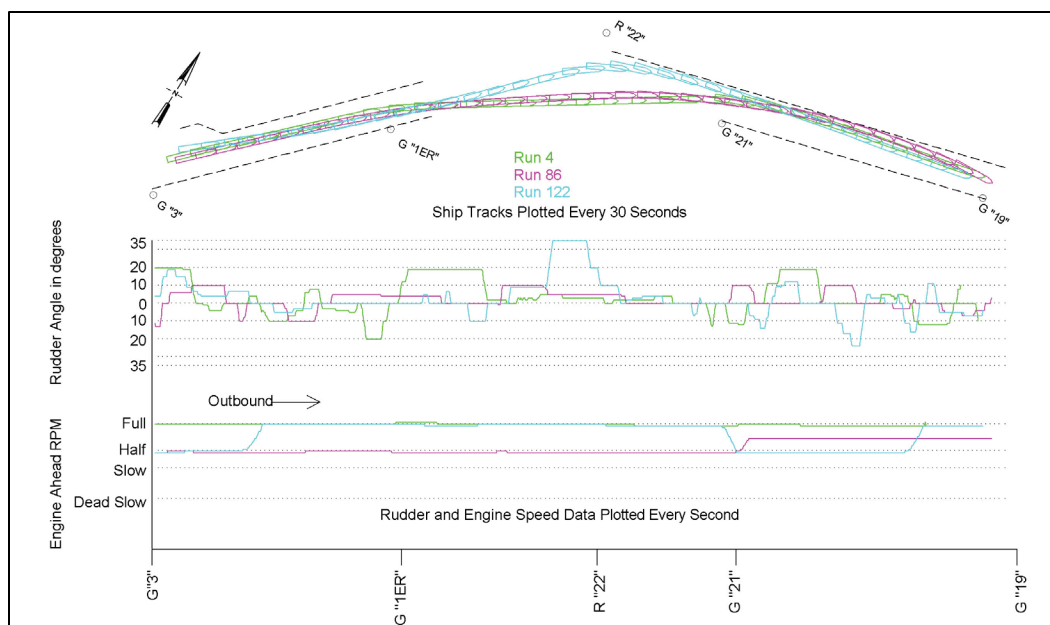


The composite plot of the inbound *Kalina* at flood tide is shown in Plates 10, 11, 12, 13, and 14. The corresponding run numbers are 1, 83, and 119. The wind was 25 knots from the northeast. The transits of the TSC are shown in Plates 11 and 12. One ship crossed the channel line between buoy R "14" and R "16" (Plate 12) where the water is naturally deep. Plate 13 contains the Inset 3 tracks of the NHER. Two of the ships left the authorized channel limits to take advantage of the naturally deep water. Figure 13 shows the rudder and engine for Runs 1, 83, and 119 as the *Kalina* transited inbound with flood tide. Throughout all of the runs, each transit required only moderate rudder angles and engine speeds. The tracks of all three ships are very smooth and none show sudden swerves that could indicate an attempt to change course. Moderate rudder angles and engine speeds indicate the inbound *Kalina*'s transit at flood tide was well within its full available maneuverability. All three ships completed the exercise as shown in Plate 14.

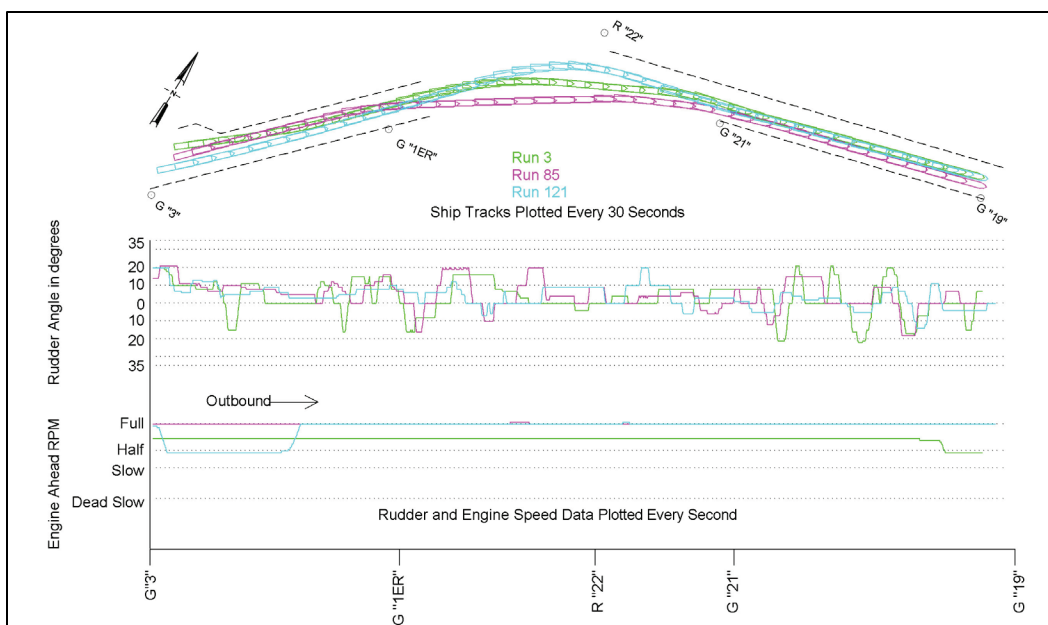
Figure 6. Maneuverability plot, inbound *Kalina* with flood tide.

### Outbound *Kalina* scenarios

The composite plot of the outbound *Kalina* at ebb tide is shown in Plates 15, 16, 17, and 18. The runs shown in the track plots are run numbers 4, 5, 86, and 122. Note that Run 5 is a continuation of Run 4. The wind was 25 knots from the southwest. These runs will be discussed as they head outbound. Note that the order of the insets has been reversed. Plate 15 contains the complete runs. The start of the outbound run is shown in Plate 16 (Inset 1). All three vessels remained near the channel centerline. Plate 17 contains the NHER plots. One ship Run 4 swung farther north and ran aground just past buoy G "3." The run was aborted and restarted in the northern end of the Elizabeth River as Run 5. All runs, excluding Run 5, remained within the channel limits of NHER. Figure 14 shows the rudder and engine for Runs 4, 86, and 122 as the *Kalina* transited outbound with ebb tide. Run 122 was hard to port for approximately 40 sec while full ahead in the naturally deep area west of buoy R "22." This was done to start a turn and does not indicate a problem with reserve maneuverability. Examination of rudder angle and engine speed plots indicates that none of the outbound *Kalina*'s transiting at flood tide required the ship's full maneuverability to remain in the channel. The ships' partial transits of TSC are shown in Plate 18. The exercises were stopped just before the CBBT. The pilots were not having trouble remaining in the 1,000 ft TSC, so the exercises were ended before they entered the 1,300 ft wide TSC.

Figure 7. Maneuverability plot, outbound *Kalina* with ebb tide.

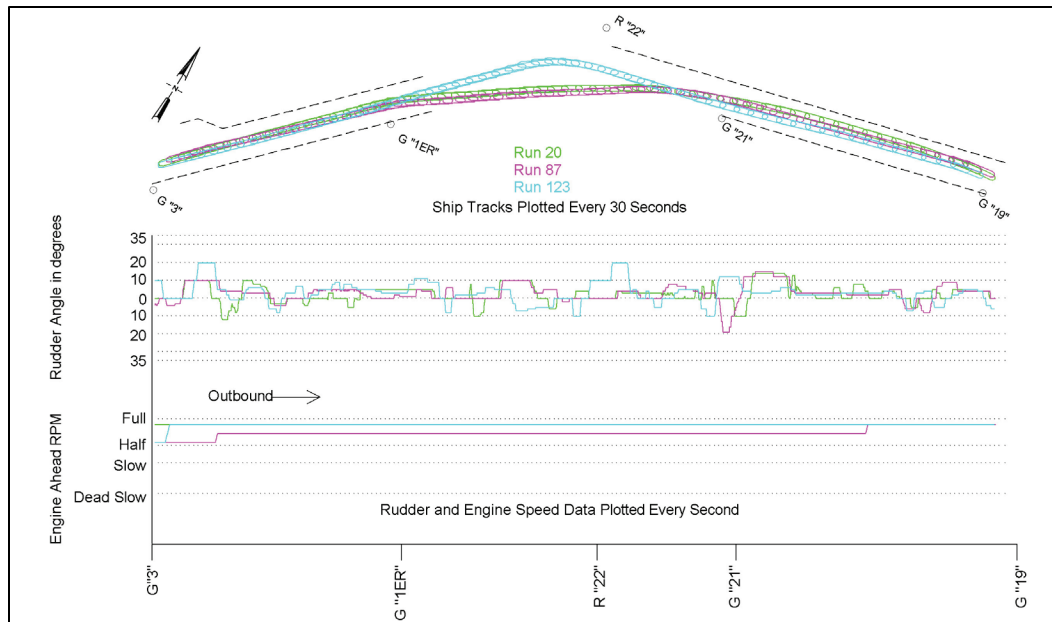
The composite plot of the outbound *Kalina* at flood tide is shown in Plates 19, 20, 21, and 22. The runs shown in the track plots are numbers 3, 85, and 121. The wind was 25 knots from the northeast. The complete track plots for this scenario are shown in Plate 19. The outbound runs end just west of the CBBT for the same reasons as the outbound ebb runs. Plate 20 contains the track plots for Inset 1. The ships tended to stay on the west side of the Craney Island Reach. The ships immediately were set to the west and carried a 5-degree crab angle very quickly after the start of the run. This was most likely caused by the wind. All three runs transited the NHER within the channel limits (Plate 21). Figure 15 shows the rudder and engine for Runs 3, 85, and 121. None of the runs used more than 25 degrees of rudder. Examination of the figure indicates that all three runs remained in the channel and that none required the ship's full maneuverability to do so. Plate 22 contains the track plots for Inset 3. One ship left the channel by approximately 25 ft as it approached buoy G "11." This was caused by an anomaly in the harbor database.

Figure 8. Maneuverability plot, outbound *Kalina* with flood tide.

### Outbound bulker from Lamberts Point Coal Terminal (LPCT)

The composite plot for the entire transit of three bulker simulations, outbound from the LPCT is shown in Plate 23. The insets are shown in Plates 24, 25, and 26. The runs shown are numbers 20, 87, and 123. These are the only simulations conducted from the terminal to the CBBT. Inbound colliers are in ballast and reflect no change from present day operation; therefore, they were not simulated. The outbound simulations were conducted at flood current to replicate present-day operation. Presently, fully loaded (48 ft to 50 ft draft) ships sail from LPCT early in the flood tide. This is done so they will have high water in the AOC. The simulations were stopped at the CBBT. The pilots felt they had completed enough of the TSC to evaluate the scenario. Also, west of the CBBT the TSC is 1,000 ft wide. The improved TSC (Meeting Area 2) widens to 1300 ft east of the CBBT. Thus, the portion of the TSC west of the CBBT is more difficult and was the focus of the simulation effort for the bulker. Wind for the simulations was 25 knots from the north. However, the wind has minimal effect upon the loaded colliers. None of the runs left the authorized channel at any point in the transits. Figure 16 shows the rudder and engine for Runs 20, 87, and 123 as the bulker transited outbound with flood tide. None of the runs used more than 20 degrees of rudder. Examination of the figure indicates that all three runs remained in the channel and that none required the ship's full maneuverability to do so.

Figure 9. Maneuverability plot, outbound bulker with flood tide.



### Outbound bulker from Kinder Morgan Bulk Terminal

The composite plot for the entire transit of three bulker simulations, outbound from the Kinder Morgan Bulk Terminal, is shown in Plate 27. The runs shown are numbers 20, 87, and 123. The exercises were conducted with flood tide and 25 knots of wind from the north. These are the only simulations conducted from the terminal to the CBBT for the same reason already discussed for colliers outbound from the LPCT. The simulations were ended after the ships entered Norfolk Harbor Entrance Reach. At that point, the exercises became redundant with those outbound from LPCT. All three transits followed similar paths, staying to the southern side of the Newport News Channel. The simulations for the fully loaded bulkers indicated little effect from the wind.

A maneuverability plot is not furnished because these scenarios did not transit the NHEC.

### Meeting scenarios in Meeting Area 2

Results from the two-way traffic simulations are presented as track plots and a summary table for each condition tested. The tables present data taken from the processed output files in CADD software when ships were abeam of each other. These are not data recorded during run time by the simulator operator. Although the track plots are shown at 30 sec intervals,

1 sec interval data were used to determine when the ships were abeam of each other. The bank distance is the closest point from ship's starboard side to the channel limit. Ship/Ship is the closest point between the two ships. The indicated speed is at point of meeting.

Table 7 presents ship speed over ground data for the one-way runs previously discussed. These data are presented for comparison with the speed data for the meeting scenarios. The speed for the inbound ships is taken approximately between buoys R "6" and G "5." The one-way outbound runs did not pass the CBBT into Meeting Area 2. Therefore, the speed data are taken approximately between buoys R "10" and G"9." One of the three *Kalina* outbound runs conducted with ebb tide ended just after turning onto TSC.

Table 7. One-way run speed data for TSC.

Run	Ship	Heading	Current	Speed (knots)
1	<i>Kalina</i>	Inbound	Flood	11.8
83	<i>Kalina</i>	Inbound	Flood	11.7
119	<i>Kalina</i>	Inbound	Flood	9.6
2	<i>Kalina</i>	Inbound	Ebb	9.1
84	<i>Kalina</i>	Inbound	Ebb	9.1
120	<i>Kalina</i>	Inbound	Ebb	7.5
3	<i>Kalina</i>	Outbound	Flood	9.4
85	<i>Kalina</i>	Outbound	Flood	8.9
121	<i>Kalina</i>	Outbound	Flood	7.2
86	<i>Kalina</i>	Outbound	Ebb	10.8
122	<i>Kalina</i>	Outbound	Ebb	9.0
20	Bulker	Outbound	Flood	8.2
87	Bulker	Outbound	Flood	7.3
123	Bulker	Outbound	Flood	7.3

The tidal currents for Meeting Area 2 simulations were parallel to the channel. The magnitude for ebb currents was approximately 1 knot. The magnitude for the flood currents was slightly higher, approximately 1.3 knots.

Icons from the 1 sec data processing were added to the 30 sec track plots. These icons are solid and show the exact moment when the ships were

abeam. An inset scaled to two times the original is included and annotated with the measurements. Also, additional relevant clearances between the two ships and between each ship and bank are included in this report's discussion of each simulation exercise.

Results from the two-way simulations for Meeting Area 2 are presented grouped by scenario. Scenarios differ by ship type, current, and wind.

**Inbound *Kalina* meeting two outbound *Kalinas*, ebb tide with wind from the south**

Plates 28 – 33 contain the track plots for an inbound *Kalina* meeting two outbound *Kalina* with ebb tide and 25 knots of wind from the south. The results are summarized in Table 8 at the end of this section.

Plate 28 contains the track plots for Run 7. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Results from Run 15 are shown in Plate 29. The ships successfully met, and interaction for both meetings was manageable by the pilots.

The track plots for Run 66 are shown in Plate 30. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Plate 31 contains the track plots for Run 72. The ships successfully met, and interaction for both meetings was manageable by the pilots.

The results of Run 126 are shown in Plate 32. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Plate 33 contains the track plots from Run 132. The ships successfully met, and interaction for both meetings was manageable by the pilots.

**Table 8. Meeting results for Plates 29 – 33. One inbound *Kalina* meeting two outbound *Kalinas*. Ebb tide with 25 knots of wind from the south. Clear visibility.**

Plate	Run	Ship	First Meeting			Second Meeting		
			Ship/Bank	Ship/Ship	Speed	Ship/Bank	Ship/Ship	Speed
28	7	<i>Kalina</i> 1 Out	284	350	11.6 k			
		<i>Kalina</i> In	239		9.2 k			
		<i>Kalina</i> 2 Out				349		8.6 k
29	15	<i>Kalina</i> 1 Out	267 ft	349	13.2 k			
		<i>Kalina</i> In	276 ft		10.1 k			
		<i>Kalina</i> 2 Out				314		10.1 k
30	66	<i>Kalina</i> 1 Out	221	451	13.1 k			
		<i>Kalina</i> In	215		11.6 k			
		<i>Kalina</i> 2 Out				273		12.5 k
31	72	<i>Kalina</i> 1 Out	137	489	11.4 k			
		<i>Kalina</i> In	187		11.5 k			
		<i>Kalina</i> 2 Out				210		11.3 k
32	126	<i>Kalina</i> 1 Out	175	515	10.1			
		<i>Kalina</i> In	186		8.8 k			
		<i>Kalina</i> 2 Out				163		11.0 k
33	132	<i>Kalina</i> 1 Out	246	417	13.1 k			
		<i>Kalina</i> In	216		10.3 k			
		<i>Kalina</i> 2 Out				183		9.9 k

**Inbound *Kalina* meeting two outbound *Kalinas*, flood tide with wind from the south**

Plates 34 – 39 contain the track plots for an inbound *Kalina* meeting two outbound *Kalina* with ebb tide and 25 knots of wind from the south. The results are summarized in Table 9 at the end of this section.

The track plot for Run 6 is presented in Plate 34. The ships successfully met, and interaction for both meetings was manageable by the pilots.

The results from the Run 12 exercise are shown in Plate 35. The first pair of ships met successfully. While the interaction was managed by the pilots, the inbound ship was set to the north and was at the northern channel edge when it met the second ship.

Plate 36 contains the track plot for Run 65. The ships successfully met, and interaction for both meetings was manageable by the pilots. The inbound ship came within 21 ft of the channel edge after meeting the second outbound ship.

The track plot for Run 71 is presented in Plate 37. The ships successfully met, and interaction for both meetings was manageable by the pilots. The first outbound ship came to within 55 ft of the channel edge after meeting the inbound vessel.

The Run 125 track plot is shown in Plate 38. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Plate 39 contains the track plot of Run 131. The ships successfully met and, interaction for both meetings was manageable by the pilots.

**Table 9. Meeting Results for Plates 34 – 39. One inbound Kalina meeting two outbound Kalinas. Flood tide with 25 knots of wind from the south. Clear visibility.**

Plate	Run	Ship	First Meeting			Second Meeting		
			Ship/Bank	Ship/Ship	Speed	Ship/Bank	Ship/Ship	Speed
34	6	Kalina 1 Out	253	430	10.0 k			
		Kalina In	273		11.5 k			
		Kalina 2 Out				339		7.3 k
35	12	Kalina 1 Out	264	420	11.2 k			
		Kalina In	258		11.2 k			
		Kalina 2 Out				320		10.3 k
36	65	Kalina 1 Out	244	478	10.9 k			
		Kalina In	198		13.1 k			
		Kalina 2 Out				213		9.4 k
37	71	Kalina 1 Out	173	440	10.7 k			
		Kalina In	296		14.3 k			
		Kalina 2 Out				186		10.3 k
38	125	Kalina 1 Out	211	510	10.0 k			
		Kalina In	150		10.2 k			
		Kalina 2 Out				208		8.4k
39	131	Kalina 1 Out	186	492	10.6 k			
		Kalina In	188		12.3 k			
		Kalina 2 Out				255		

**Inbound *Kalina* meeting two outbound *Kalinas* in foggy conditions with flood tide and wind from the south**

Plates 40 – 45 contain the track plots for an inbound *Kalina* meeting two outbound *Kalina* in fog with flood tide and 10 knots of wind from the south. The fog runs were conducted with half-mile visibility. This compares with clear visibility considered to be 5 miles. The results are summarized in Table 10 at the end of this section.

The track plots from Run 19 are shown in Plate 40. After the first meeting, the outbound pilot was able to manage the interaction. However, the inbound ship was set strongly to the north followed by an extreme turn to port. The turn was so severe that the second meeting is omitted from further analysis. The pilots did not document how they would change their approach to this scenario. However, the pilots repeated the scenario after swapping positions from inbound to outbound. That run was successful and is discussed in the following paragraph.

Plate 41 contains the results from Run 11. The ships successfully met, and interaction for both meetings was manageable by the pilots.

The results from Run 70 are presented in Plate 42. The ships successfully met, and interaction for both meetings was manageable by the pilots. However, as the first outbound ship approached the inbound ship, it maneuvered to the south side of the channel, coming to within 27 ft of the channel edge.

Plate 43 contains the results from Run 76. The ships successfully met, and interaction for both meetings was manageable by the pilots. However, the inbound ship moved to the far north side of the channel to meet the first outbound ship and left the channel by approximately 17 ft after the meeting.

Plate 44 contains the track plots for Run 130. The ships successfully met, and interaction for both meetings was manageable by the pilots.

The track plot for Run 136 is shown in Plate 45. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Table 10. Meeting Results for Plates 40 – 45. One inbound *Kalina* meeting two outbound *Kalinas*. Flood tide with 10 knots of wind from the south. Foggy.

Plate	Run	Ship	First Meeting			Second Meeting		
			Ship/Bank	Ship/Ship	Speed	Ship/Bank	Ship/Ship	Speed
40	19	<i>Kalina</i> 1 Out	238	318	10.8 k			
		<i>Kalina</i> In	356		10.9 k			
		<i>Kalina</i> 2 Out						
41	11	<i>Kalina</i> 1 Out	296	300	8.5 k			
		<i>Kalina</i> In	241		11.5 k			
		<i>Kalina</i> 2 Out				196		10.6 k
42	70	<i>Kalina</i> 1 Out	136	498	11.6 k			
		<i>Kalina</i> In	261		12.2 k			
		<i>Kalina</i> 2 Out				208		9.9 k
43	76	<i>Kalina</i> 1 Out	237	603	9.9 k			
		<i>Kalina</i> In	63		14.0 k			
		<i>Kalina</i> 2 Out				283		10.5 k
44	130	<i>Kalina</i> 1 Out	180	569	11.4 k			
		<i>Kalina</i> In	168		11.5 k			
		<i>Kalina</i> 2 Out				256		10.6 k
45	136	<i>Kalina</i> 1 Out	177	566	10.6 k			
		<i>Kalina</i> In	146		14.5 k			
		<i>Kalina</i> 2 Out				166		11.0 k

### Inbound *Kalina* meeting two outbound bulkers with flood tide and wind from the north

Plates 46 – 51 contain the track plots for an inbound *Kalina* meeting two outbound bulkers in flood tide and 25 knots of wind from the north. The results are summarized in Table 11 at the end of this section.

The track plot for Run 10 is shown in Plate 46. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Plate 47 contains the track plot for Run 18. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Plate 48 contains the track plots for Run 69. The ships successfully met, and interaction for both meetings was manageable by the pilots<sup>1</sup>.

Plate 49 contains the track plots for Run 75. The ships successfully met, and interaction for both meetings was manageable by the pilots. However, the first outbound bulker came within 40 ft of the channel edge after meeting the inbound vessel.

The results of Run 129 are shown in Plate 50. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Plate 51 presents the track plot for Run 135. The ships successfully met, and interaction for both meetings was manageable by the pilots.

**Table 11. Meeting Results for Plates 46 – 51. One inbound *Kalina* meeting two outbound Bulklers. Flood tide with 25 knots of wind from the north. Clear visibility.**

Plate	Run	Ship	First Meeting			Second Meeting		
			Ship/Bank	Ship/Ship	Speed	Ship/Bank	Ship/Ship	Speed
46	10	Bulker 1 Out	231	461	7.6 k			
		<i>Kalina</i> In	217		10.5 k			
		Bulker 2 Out				239		7.6 k
47	18	Bulker 1 Out	262	382	7.5 k			
		<i>Kalina</i> In	254		13.6 k			
		Bulker 2 Out				210		6.9 k
48	69	Bulker 1 Out	154	535	8.0 k			
		<i>Kalina</i> In	231		13.1 k			
		Bulker 2 Out				161		7.6 k
49	75	Bulker 1 Out	202	410	7.6 k			
		<i>Kalina</i> In	295		13.0 k			
		Bulker 2 Out				235		7.5 k
50	129	Bulker 1 Out	182	496	7.9			
		<i>Kalina</i> In	239		11.2 k			
		Bulker 2 Out				187		
51	135	Bulker 1 Out	209	559	7.7 k			
		<i>Kalina</i> In	158		13.7 k			
		Bulker 2 Out				206		7.8 k

<sup>1</sup> Track data show the first outbound bulker ran aground approximately 2,300 ft after the meeting the inbound containership. This was due to an inadvertent continuation of the simulation after the pilot had left the bridge and is not indicative of the channel design.

**Outbound *Kalina* meeting two inbound *Kalinas*, ebb tide with wind from the north**

Plates 52 – 57 contain the track plots for an outbound *Kalina* meeting two inbound *Kalinas* with ebb tide and 25 knots of wind from the north. The results are summarized in Table 12 at the end of this section.

The track plots for Run 9 are shown in Plate 52. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Plate 53 contains the track plots for Run 17. The ships successfully met, and interaction for both meetings was manageable by the pilots.

The track plots for Run 68 are shown in Plate 54. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Plate 55 contains the track plots for Run 74. The outbound ship met the first inbound ship near buoy R “4.” The outbound ship pilot recovered and was able to successfully meet the second inbound ship. However, the first inbound ship left the channel by nearly 20 ft on the north side before returning to center of the channel.

Plate 56 contains the track plots for Run 128. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Plate 57 contains the track plots for Run 134. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Table 12. Meeting Results for Plates 52 – 57. One outbound *Kalina* meeting two inbound Kalinas. Ebb tide with 25 knots of wind from the north. Clear visibility.

Plate	Run	Ship	First Meeting			Second Meeting		
			Ship/Bank	Ship/Ship	Speed	Ship/Bank	Ship/Ship	Speed
52	9	<i>Kalina</i> 1 In	247	383	8.7 k			
		<i>Kalina</i> Out	295		11.0 k			
		<i>Kalina</i> 2 In				226		8.6 k
53	17	<i>Kalina</i> 1 In	323	318	10.6 k			
		<i>Kalina</i> Out	285		12.5 k			
		<i>Kalina</i> 2 In				190		13.1 k
54	68	<i>Kalina</i> 1 In	289	429	11.6 k			
		<i>Kalina</i> Out	191		12.2 k			
		<i>Kalina</i> 2 In				143		7.9 k
55	74	<i>Kalina</i> 1 In	174	347	11.0 k			
		<i>Kalina</i> Out	378		13.9 k			
		<i>Kalina</i> 2 In				208		9.4 k
56	128	<i>Kalina</i> 1 In	210	521	9.2 k			
		<i>Kalina</i> Out	200		10.8 k			
		<i>Kalina</i> 2 In				114		8.1 k
57	134	<i>Kalina</i> 1 In	229	552	11.6 k			
		<i>Kalina</i> Out	119		10.8 k			
		<i>Kalina</i> 2 In				158		10.4 k

### Outbound *Kalina* meeting two inbound *Kalinas*, flood tide with wind from the north

Plates 58 – 63 contain the track plots for an outbound *Kalina* meeting two inbound Kalinas with flood tide and 25 knots of wind from the north. The results are summarized in Table 13 at the end of this section.

The track plots for Run 8 are presented in Plate 58. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Plate 59 contains the track plots for Run 16. The ships successfully met, and interaction for both meetings was manageable by the pilots.

The track plot for Run 67 is shown in Plate 60. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Plate 61 contains the track plots for Run 73. The ships successfully met, and interaction for both meetings was manageable by the pilots. However, after meeting the first ship, the outbound ship stayed on the southern edge of the channel, leaving the channel by over 5 ft.

The track plots for run 127 are presented in Plate 62. The ships successfully met, and interaction for both meetings was manageable by the pilots.

Plate 63 contains the track plots for Run 133. The ships successfully met, and interaction for both meetings was manageable by the pilots.

**Table 13. Meeting Results for Plates 58 – 63. One outbound *Kalina* meeting two inbound *Kalinas*. Flood tide with 25 knots of wind from the north. Clear visibility.**

Plate	Run	Ship	First Meeting			Second Meeting		
			Ship/Bank	Ship/Ship	Speed	Ship/Bank	Ship/Ship	Speed
58	8	<i>Kalina</i> 1 In	267	393	11.1 k	101	347	10.9 k
		<i>Kalina</i> Out	185		10.2 k			
		<i>Kalina</i> 2 In			380			
59	16	<i>Kalina</i> 1 In	218	365	12.2 k	206	361	10.6 k
		<i>Kalina</i> Out	254		10.2 k			
		<i>Kalina</i> 2 In			272			
60	67	<i>Kalina</i> 1 In	181	459	13.5 k	175	416	11.4 k
		<i>Kalina</i> Out	180		11.7 k			
		<i>Kalina</i> 2 In			174			
61	73	<i>Kalina</i> 1 In	281	478	13.4 k	63	413	12.2 k
		<i>Kalina</i> Out	132		11.6 k			
		<i>Kalina</i> 2 In			339			
62	127	<i>Kalina</i> 1 In	173	543	10.1 k	166	563	8.3 k
		<i>Kalina</i> Out	181		11.6 k			
		<i>Kalina</i> 2 In			169			
63	133	<i>Kalina</i> 1 In	222	506	13.7 k	179	435	11.4 k
		<i>Kalina</i> Out	140		10.8 k			
		<i>Kalina</i> 2 In			256			

## 5 Conclusions

**Atlantic Ocean Channel.** The AOC was simulated in the same manner it operates in real life. All simulations were conducted with a master mariner, rather than a VPA pilot conning the ship. Based upon an analysis of the data and observations during the simulations, the NED plan to deepen the AOC and allow deeper-drafted ships to transit should operate as expected.

**Harbor Deepening from TSC to terminals.** Simulations of the deeper-drafted vessels transiting the area between the terminals through or mostly through the TSC show areas where the pilots deliberately maneuvered their ships from the authorized channel to take advantage of naturally deep water. This is standard operating practice today in Norfolk Harbor but will be reevaluated by the pilots as the channels are modified to accommodate deeper drafting vessels.

Eight of the twelve simulations of the *Kalina* transiting the Norfolk Harbor Entrance Reach did so without straying outside the channel. All three bulkers transiting outbound through the Norfolk Harbor Entrance Channel remained in the channel.

Plots of ship maneuverability were included for all the transits of NHER. These plots documented the use of rudder and engine speed as the ship maneuvered along the NHER. These figures indicated that the pilots had a significant amount of ship maneuverability available to use if required.

None of the pilots expressed any concern with bringing the deeper-drafted ships through this reach in real life. They simply operated the way they do presently, intentionally using the naturally deep water. As previously stated, both the bulker and containership presently call at Norfolk Harbor on a regular basis at a lighter draft. They do not presently have problems with these ships.

Based upon an analysis of the data and observations during the simulations, the NED plan to deepen and widen the harbor channels should operate as expected and will allow deeper drafted ships to access Hampton Roads marine terminals.

**Meeting Area 2.** The majority of the simulation effort focused on Meeting Area 2. Thirty-six simulations were conducted in Meeting Area 2. Each simulation had 2 meetings, so a total of 72 actual meetings were included in the program. The minimum ship-to-ship clearance recorded during these runs was 258 ft (Plate 28). The next smallest clearance was 300 ft (Plate 41).

The pilots felt that ship-to-ship interaction on the simulator was not what they would expect in real life when the ULCVs meet other ULCVs or large bulkers. The interaction forces did not seem to be as sensitive to the distance between the ships as the pilots expected. The interaction did seem to be somewhat sensitive to the vessels' speeds. In general, the pilots operated their ownships somewhat faster for the Meeting Area 2 simulation than for the one-way transits. The maximum speeds as recorded in Table 7 were all less than 12 knots for one-way traffic. Only three ships were recorded going faster than 10 knots. For the meetings conducted during simulation of Meeting Area 2, 30 ships were traveling at 12 knots or faster.

Despite their concerns regarding the interaction, the pilots indicated that the simulations of Meeting Area 2 provided sufficient data to extrapolate how the ships will handle in the proposed condition.

In the pilots' final questionnaire, the consensus was that Meeting Area 2 would function as designed. One pilot stated that the interaction made him feel uncomfortable at speeds at which they normally pass today. However, they do not pass ships this large. These are presently restricted to one-way traffic.

Based upon the pilots' ability to evaluate the future channel based upon their simulator experience, the 1,300 ft wide Meeting Area 2 should function as expected.

## References

- Lawrence, G., and E. Smith. 2019. *Memorandum VIMS Model Refinements for Norfolk Ship Simulations*. Baltimore, MD: Moffatt & Nichol.
- Martin, S. K. 2017. *Norfolk Harbor Feasibility Ship Simulations Study Report Memorandum*. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- Moffatt & Nichol. 2018. *Norfolk Harbor and Channels Deepening: Navigation Simulation Plan*. Baltimore, MD: Moffatt & Nichol.
- USACE (U.S. Army Corps of Engineers), NAO (Norfolk District), and VPA (Virginia Port Authority). 2018. *Norfolk Harbor Navigation Improvements: General Reevaluation Report and Environmental Assessments*. Norfolk District and Virginia Port Authority.

## **Appendix A: Virginia Pilot Endorsement Letter**



# Virginia Pilot Association

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March 5, 2019

Colonel Patrick V. Kinsman  
Commander and District Engineer  
U. S. Army Corps of Engineers  
803 Front St.  
Norfolk, Virginia 23510

Dear Colonel Kinsman,

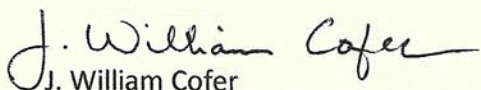
On behalf of the Virginia Pilot Association, we have greatly appreciated the opportunity to participate in the design analysis of the Norfolk Harbor 55' deepening project. The project as a whole will have enormous benefits to safe and efficient movement of cargo into the Commonwealth and the United States.

The Virginia Branch Pilots have thoroughly reviewed the report and appendices provided along with evaluating all of the simulation runs. We are satisfied this report accurately evaluates the simulations our pilots participated in and strongly recommend fully implementing the proposed deepening of the channels and construction of Meeting Area 2.

We also remain especially interested in meeting area 1 as hydrodynamics reflect the critical nature of extending the width of this channel to 1400'. Channel widths of lesser dimensions along this particular segment do not allow sufficient margins of safety for the current global shipping fleet to meet and will not accommodate two-way traffic. The proposed design of Meeting Area 1 solves the safety challenges we currently face.

We are very pleased with the overall recommendations to deepen and widen the channel routes into Virginia waters as outlined in the Norfolk Harbor deepening project report. We support the simulation results as part of the design documentation report and thank you for the opportunity to comment on this critical navigational safety issue.

Regards,

  
J. William Cofer  
President, Virginia Pilot Association

## **Appendix B: Moffet & Nichol Hydrodynamic Memorandum**

## Memorandum

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**To:** ERDC and Virginia Port Authority  
**From:** Gwen Lawrence  
Eric Smith, PE  
**Date:** January 2019  
**Subject:** VIMS Model Refinements for Norfolk Ship Simulations  
**Project:** Norfolk Harbor Navigation Improvements Preconstruction Engineering and Design

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This memorandum documents further analysis completed by Moffatt & Nichol to compare the two hydrodynamic models discussed in detail in “Further Study of Channel Deepening in Lower Chesapeake Bay to Support Ship Simulations” (Zhang et al., 2018).

The Virginia Institute of Marine Science (VIMS) had originally developed a 3D unstructured-grid hydrodynamic model SCHISM (Zhang et al., 2017) to investigate the impact of channel dredging on the hydrodynamics in the lower Chesapeake Bay area. This grid model had resolution up to 15 m. Since competition of this model the channel deepening project proposed in the Thimble Shoals, Norfolk Harbor and the Elizabeth River Channels has been modified to include a meeting area east of the Chesapeake Bay Bridge Tunnel, known as Meeting Area #2. Additionally, to validate the channel dredging project geometry there was the need to perform ship simulations which required a depth-averaged flow field. There were concerns regarding the resolution of the original hydrodynamic model for the ship simulation effort. As a result, the SCHISM model was updated with higher grid resolution in the navigation channel from the Atlantic Ocean through Norfolk to Newport News. The grid resolution was increased 2 times in the longitudinal and 3-4 times in the lateral directions. Further information on the grid refinement can be found in “Further Study of Channel Deepening in Lower Chesapeake Bay to Support Ship Simulations” (Zhang et al., 2018).

The ship simulation study was performed using the original model grid resolution since the refined hydrodynamic results were not available at the time of the study. Therefore, to address the concerns a thorough comparison between the original model and the higher resolution model has been completed by VIMS to show that the depth-averaged velocities did not significantly change with the higher grid resolution or the addition of Meeting Area #2 (Zhang et al., 2018). Moffatt & Nichol perform further analysis to compare the two hydrodynamic models to show that the depth-average velocities used for the ship simulation study did not significantly change.

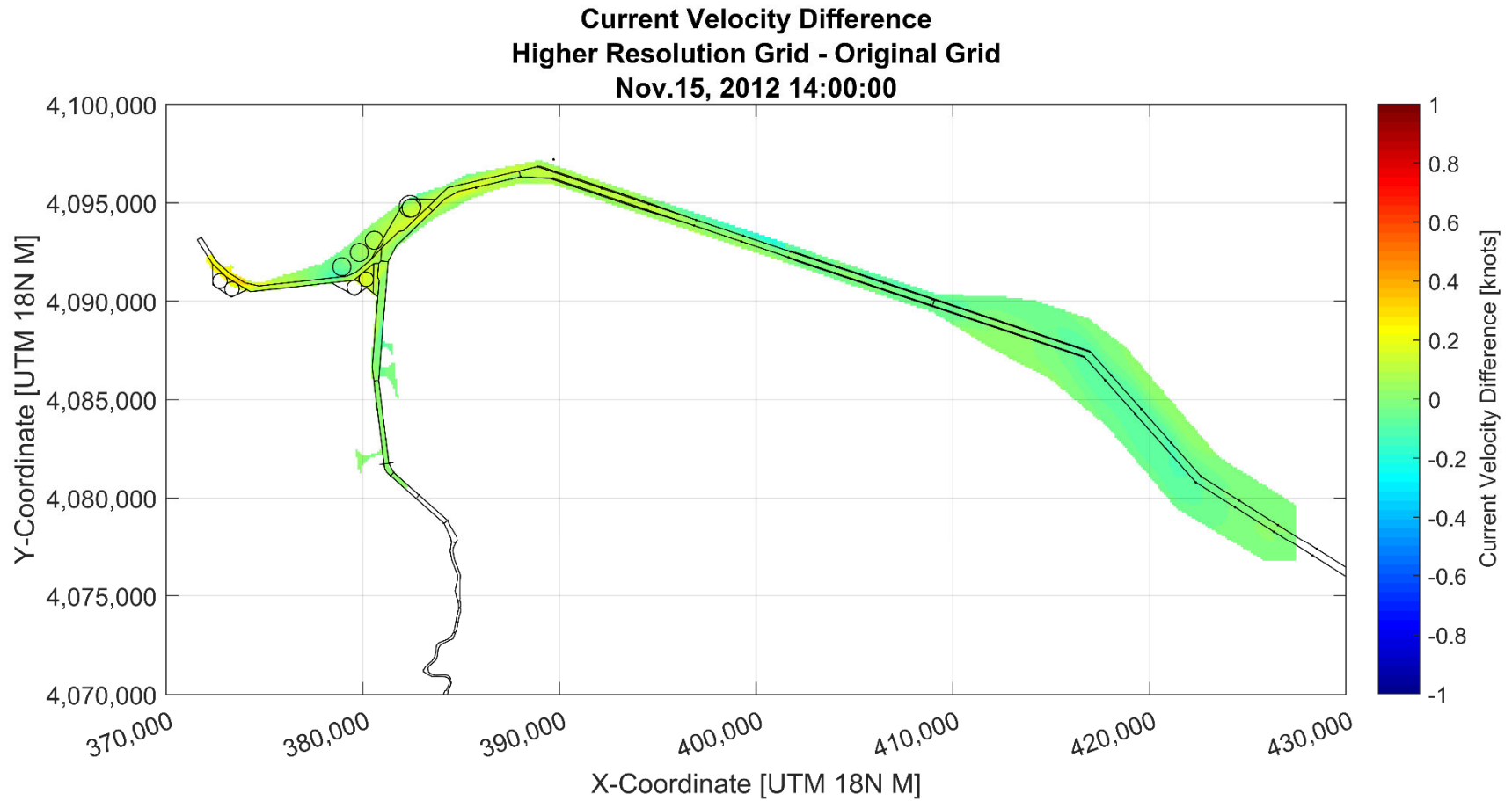


For the ship simulation study a two-dimensional time-varying current field from the original hydrodynamic model was used to drive the currents. A representative 24-hour period during a typical spring tide was identified. For each simulation, a time point is selected from the time-varying current field to represent the current field at the start of the simulation, and the currents are updated in the model in real time starting from the initial current field. For the majority of the vessel simulations the current field was initiated at either peak flood (14:00) or peak ebb (20:00) tidal currents. As a result, this analysis will focus on the model output hourly from 14:00 to 24:00. The longest vessel simulation took approximately 3 hours.

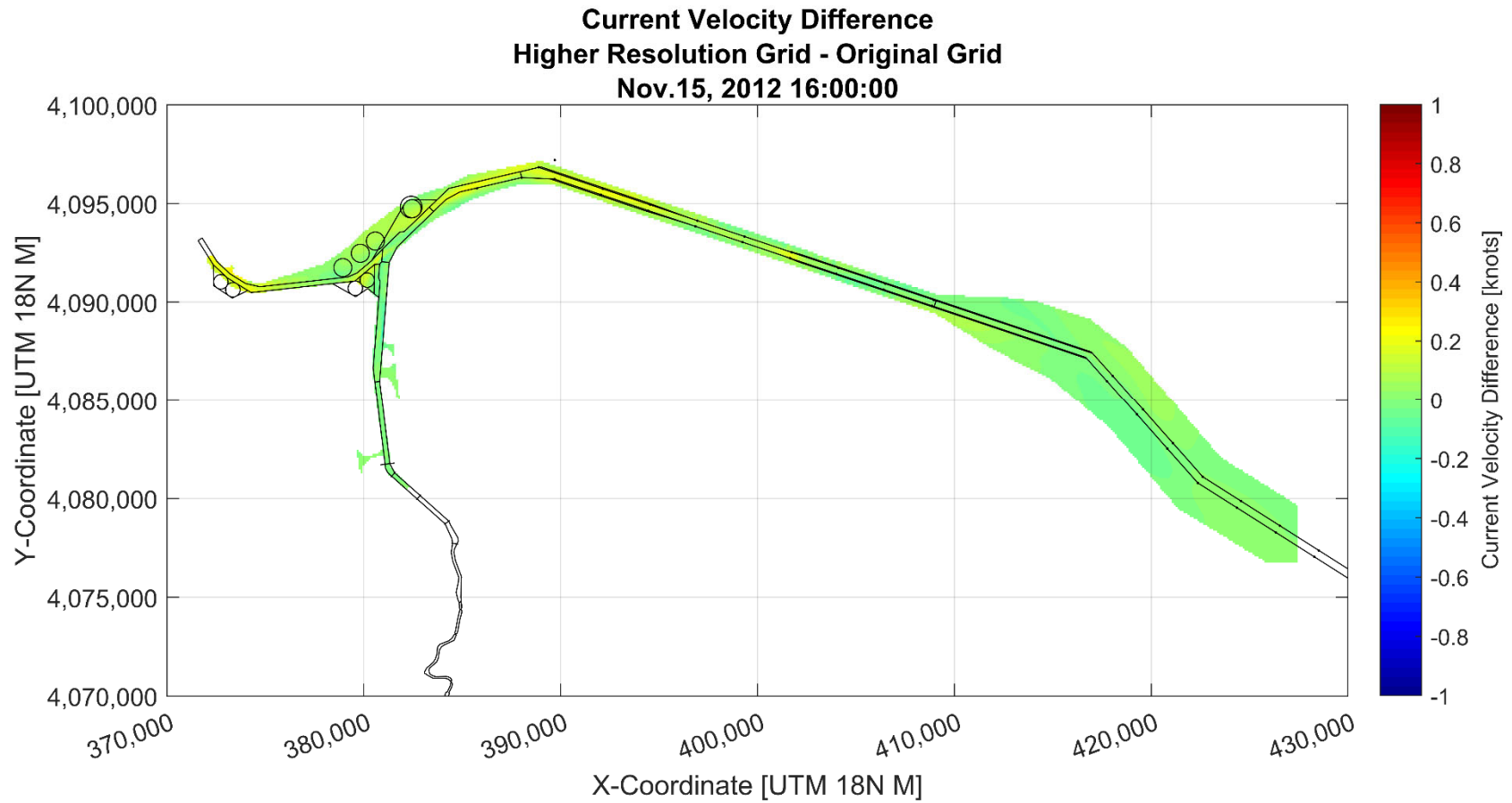
To evaluate the difference in current magnitudes between the original model and the higher resolution model heat maps were created. To compose the heat maps a surface was created for each grid and then each surface was interpolated to the same points to allow a difference to be determined from the two models. The difference in current magnitude between the original grid and higher resolution grid are shown every two hours for the time period of interest in Figure 1. Current Velocity Difference between the Higher Resolution Grid and the Original Grid at 14:00. Figure 1 to Figure 6. A positive difference shows when the higher resolution grid shows higher current magnitudes than the original grid. Additionally, two area insets, Figure 7, for the peak flood and peak ebb currents are shown in Figure 8 to Figure 11. From these plots the majority of the difference between the two grids resulted in a current magnitude difference of less than 0.2 knots. The one exception was in the Newport News Channel where differences of approximately 0.5 knots were calculated between the two grids. However, it should be noted that this difference was calculated for timesteps 20:00 to 24:00 during the ebb current conditions. Simulations in the Newport News Channel were only performed during the flood current condition. There is one small area adjacent to anchorages, I-1 and I-2, in the Newport News Channel that had differences of approximately 0.35 knots during the flood current condition. However, at this location the coal colliers would be under tug power as it approached the Kinder Morgan and Dominion Coal Terminals. The typical current magnitude in the vicinity of anchorages was approximately 0.6 to 0.8 knots.

The difference in current direction between the original model and the higher resolution model was evaluated for the peak flood and peak ebb currents by vector plots. To create the vector plots a surface was created for each grid and then each surface was interpolated to the same points to allow comparison at the same point. The vector maps for the two insets, Figure 7, for peak flood and peak ebb are shown in Figure 12 to Figure 15. The vector length was normalized such that all the vectors are the same length as these plots were solely intended to compare current direction and not magnitude. On the vector plots it is hard to see the red arrows showing the original grid because the vectors from the two grids have negligible to no difference. There is noticeable difference between the two grid vectors during the flood currents near the Kinder Morgan Terminal. However, these currents are well outside the channel where the ship simulations were performed.

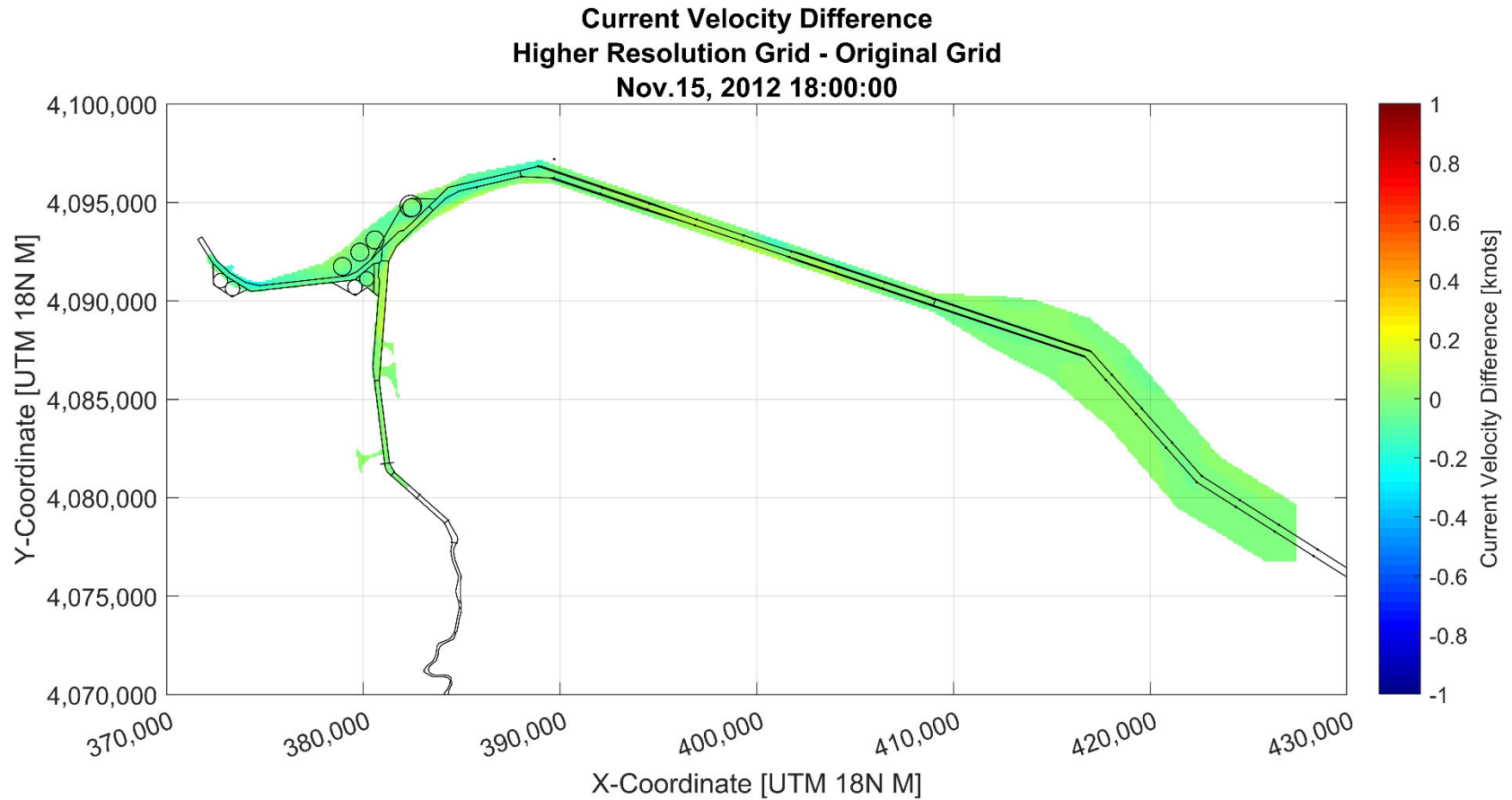
Overall, the difference between the two hydrodynamic model resolutions was negligible for the currents used for the ship simulations. Therefore, no additional simulations need to be performed with the higher resolution current database at this time.



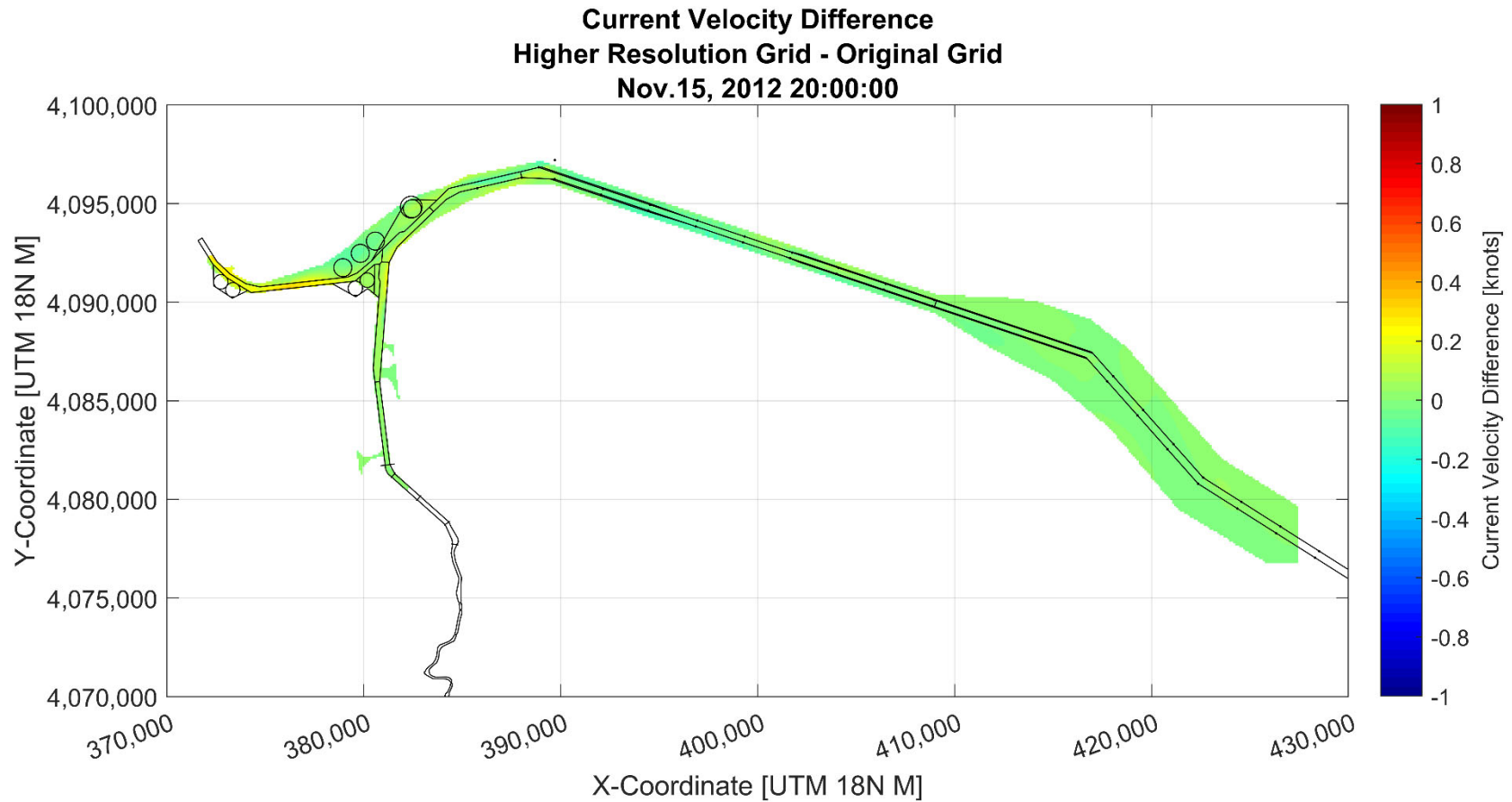
**Figure 1. Current Velocity Difference between the Higher Resolution Grid and the Original Grid at 14:00.**



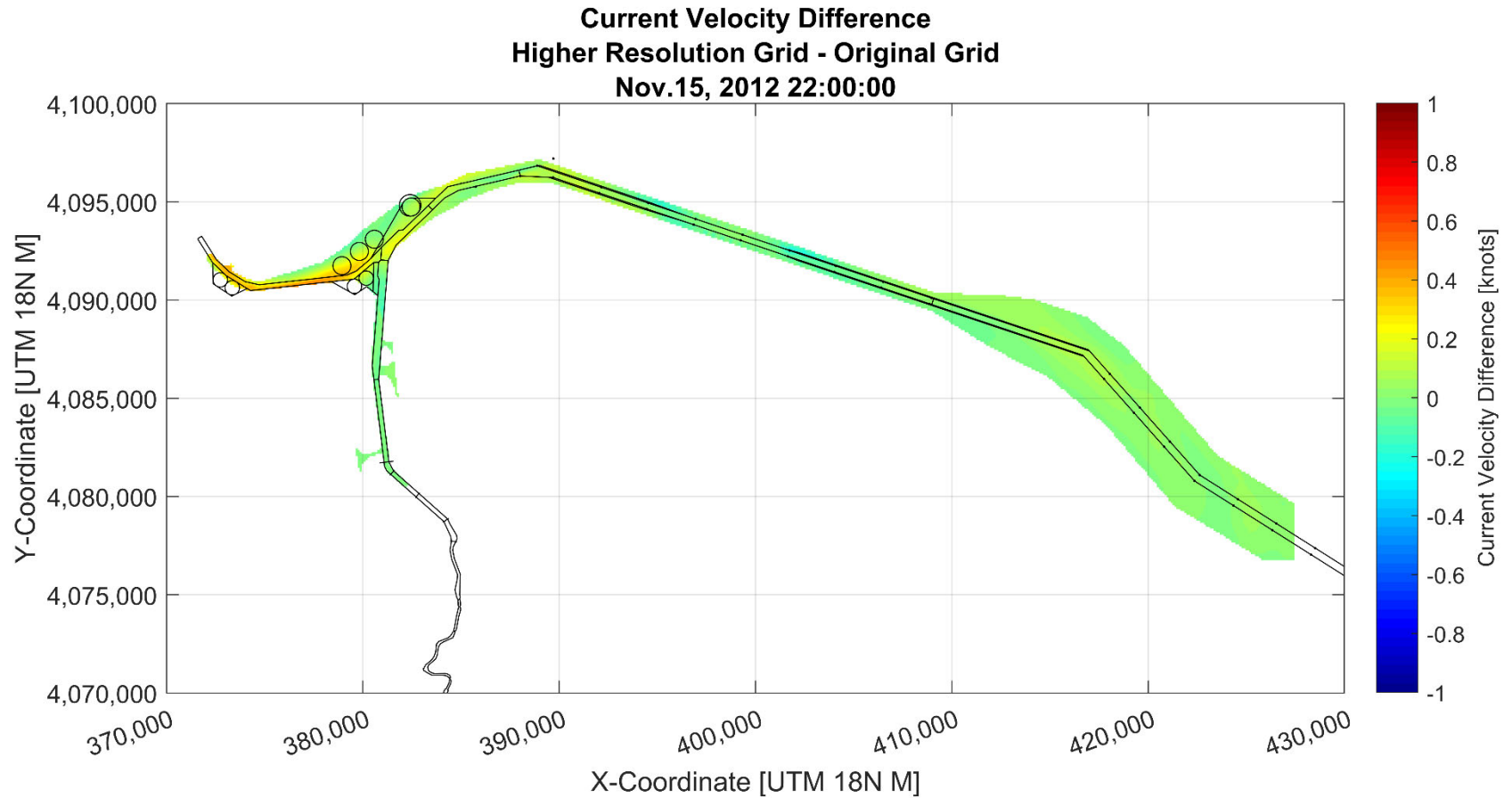
**Figure 2. Current Velocity Difference between the Higher Resolution Grid and the Original Grid at 16:00.**



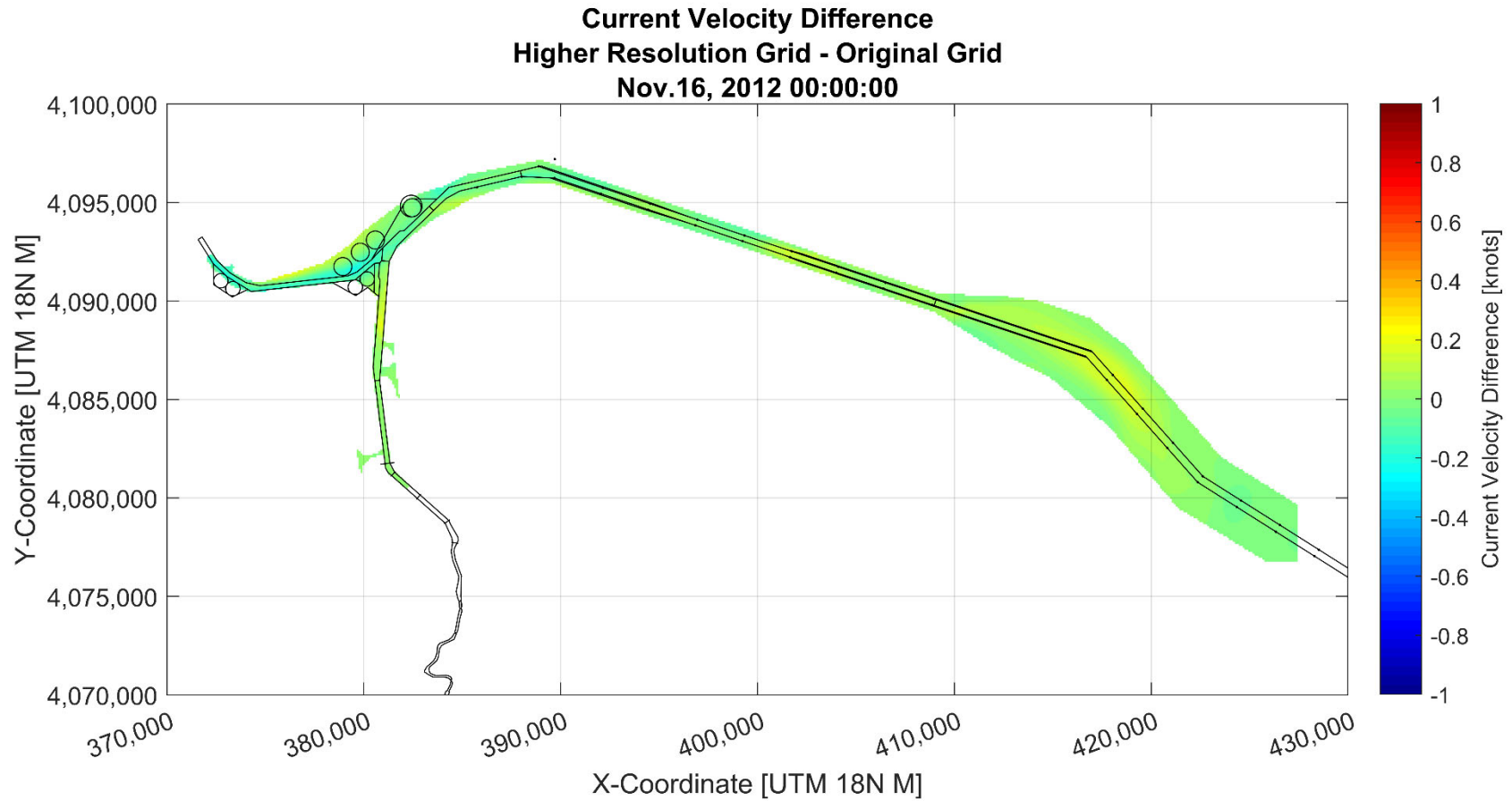
**Figure 3. Current Velocity Difference between the Higher Resolution Grid and the Original Grid at 18:00.**



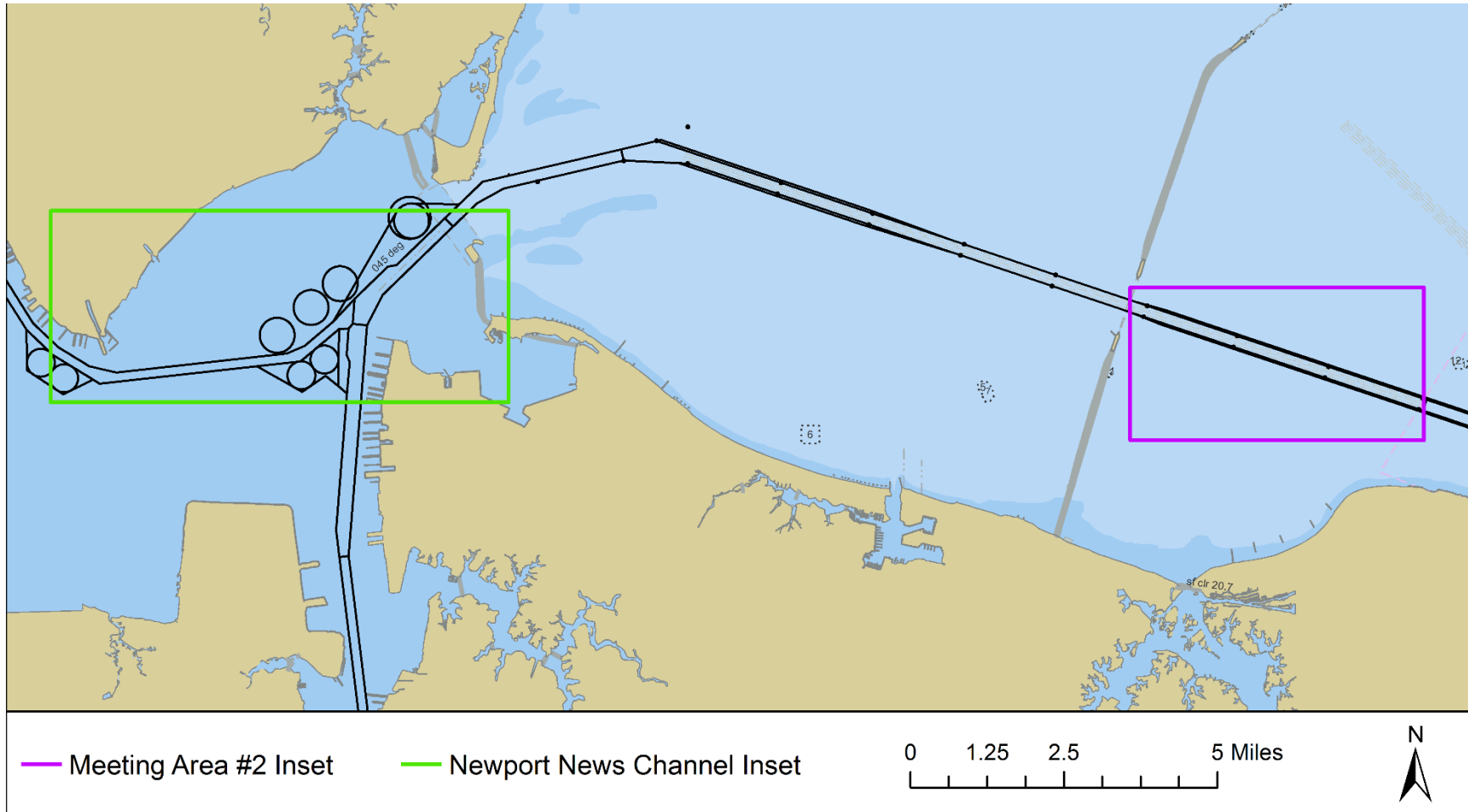
**Figure 4. Current Velocity Difference between the Higher Resolution Grid and the Original Grid at 20:00.**



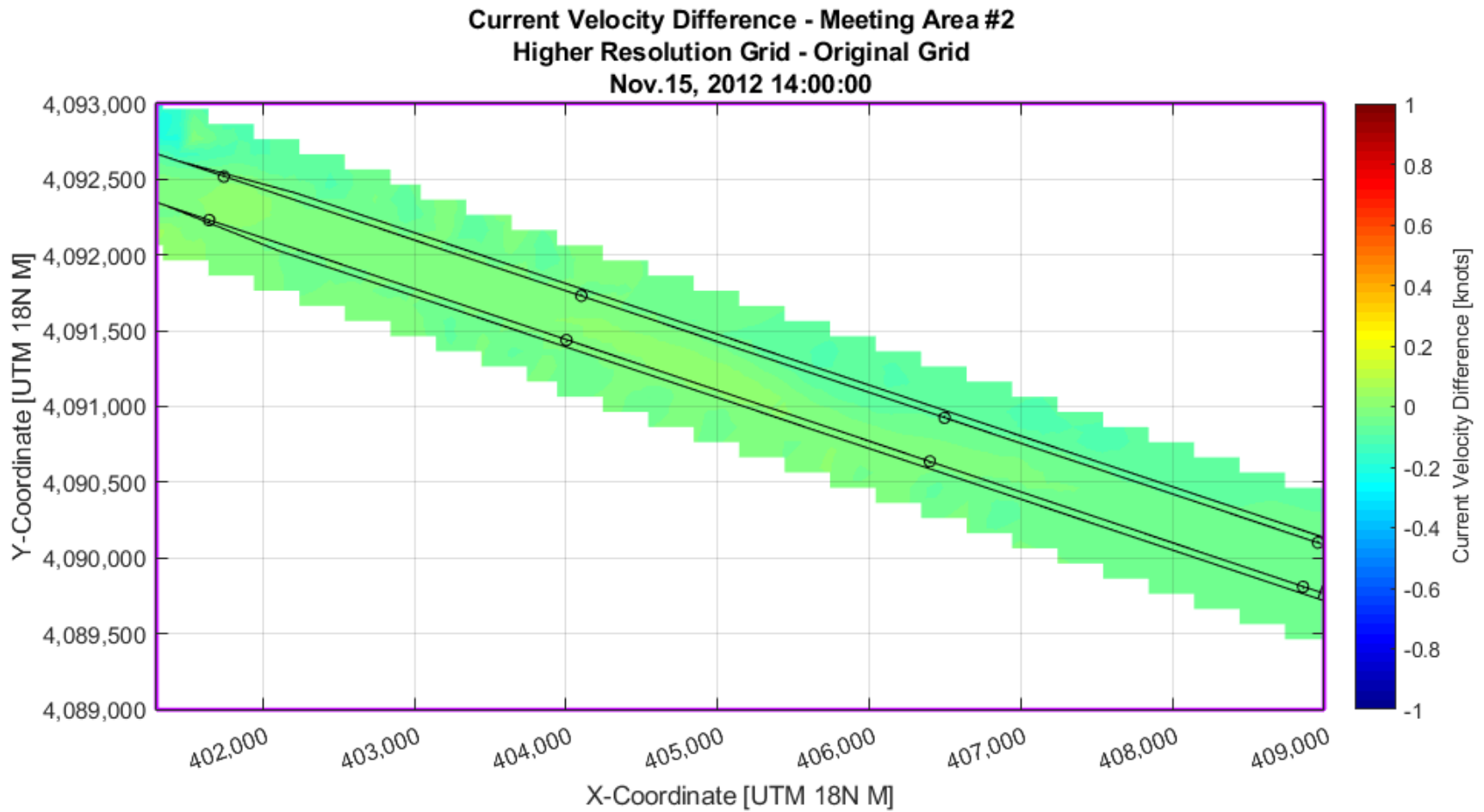
**Figure 5. Current Velocity Difference between the Higher Resolution Grid and the Original Grid at 22:00.**



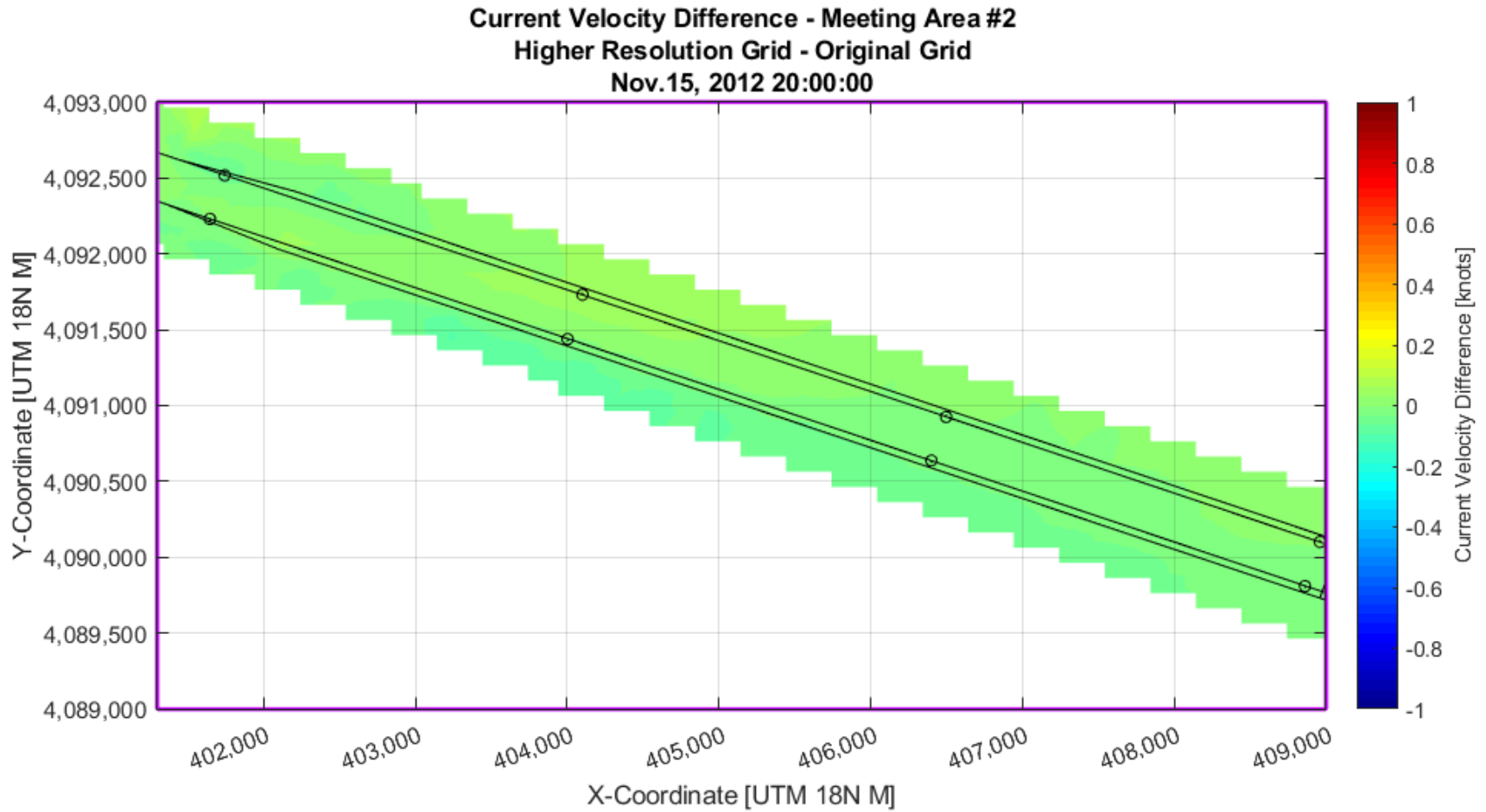
**Figure 6. Current Velocity Difference between the Higher Resolution Grid and the Original Grid at 00:00.**



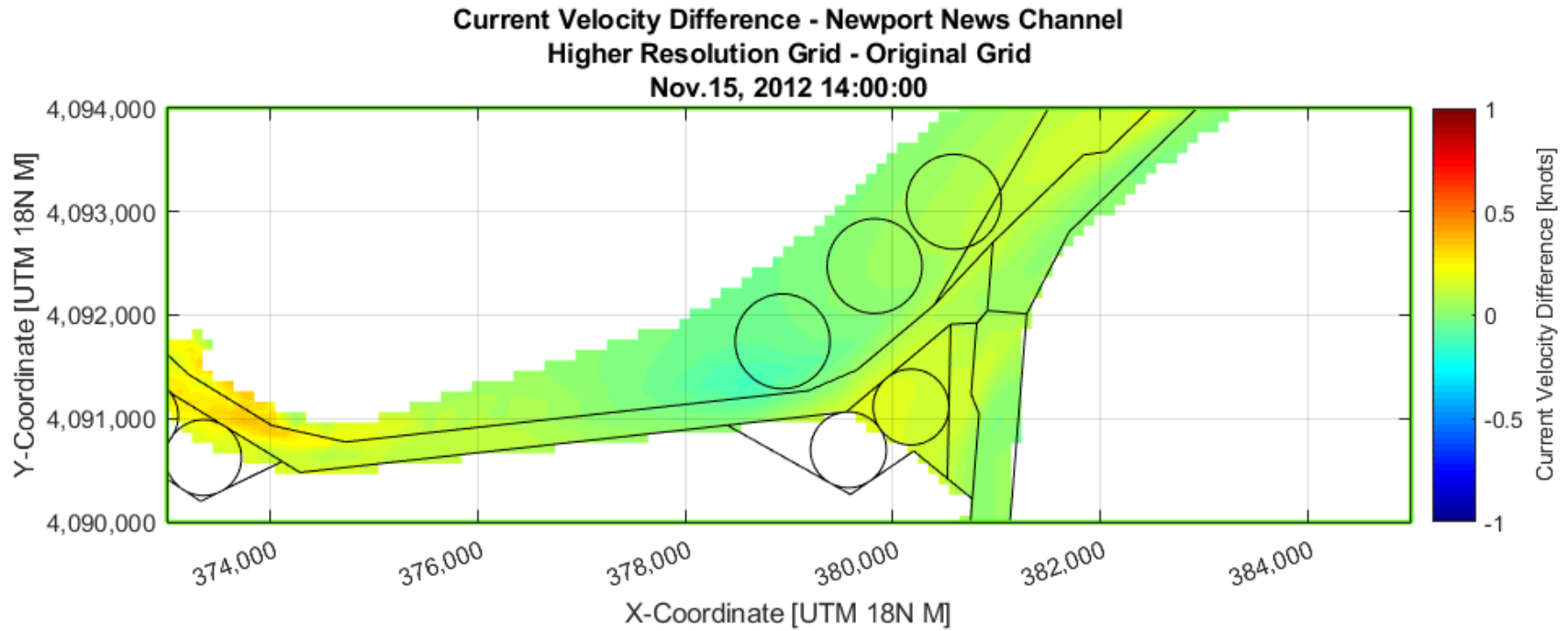
**Figure 7. Inset Map Figure.**



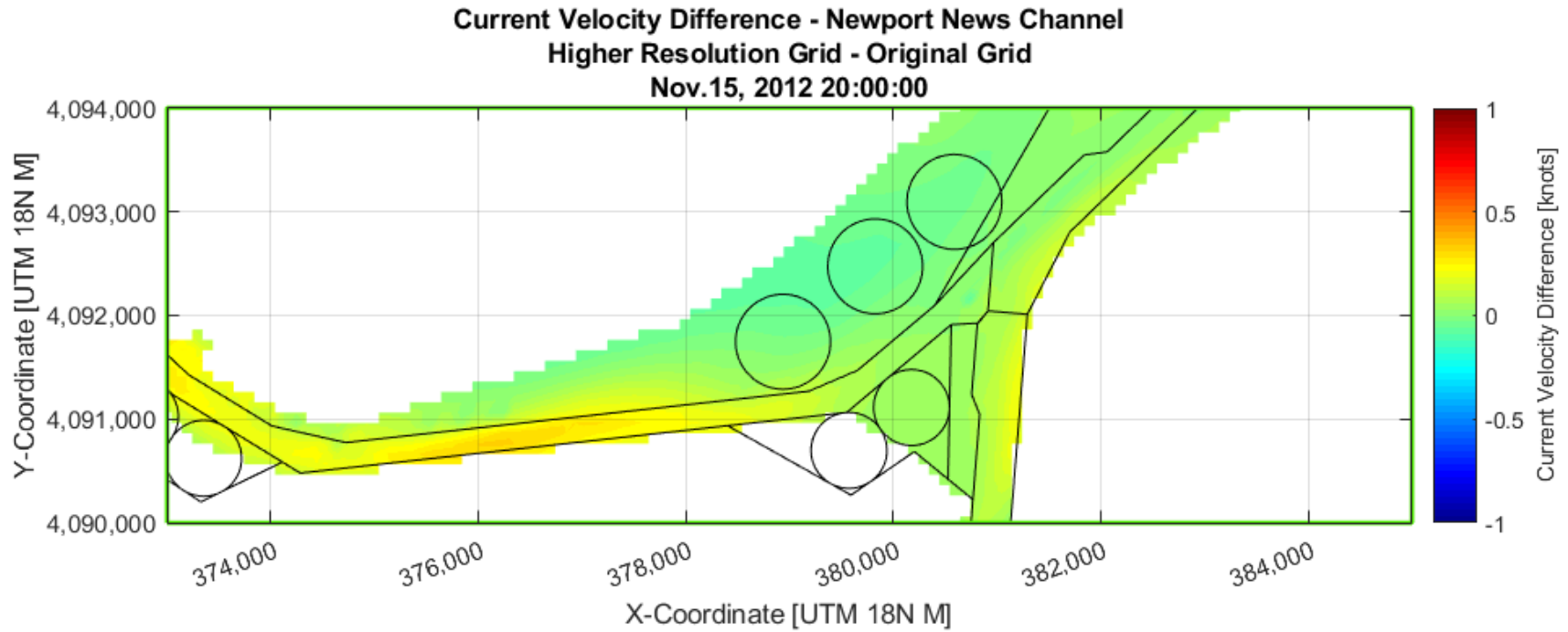
**Figure 8. Current Velocity Difference between the Higher Resolution Grid and the Original Grid in Meeting Area #2 during Flood Current.**



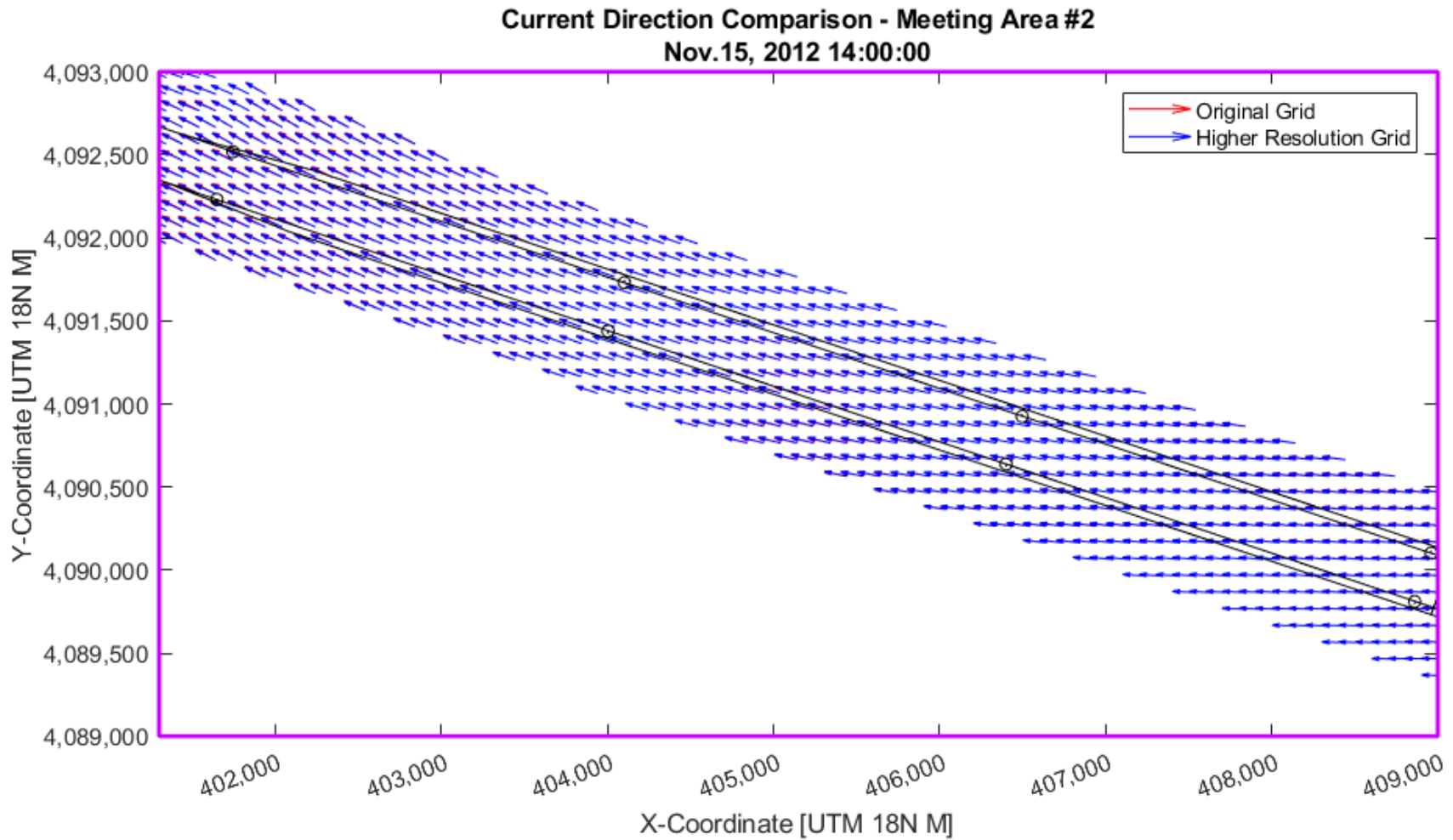
**Figure 9. Current Velocity Difference between the Higher Resolution Grid and the Original Grid in Meeting Area #2 during Ebb Current.**



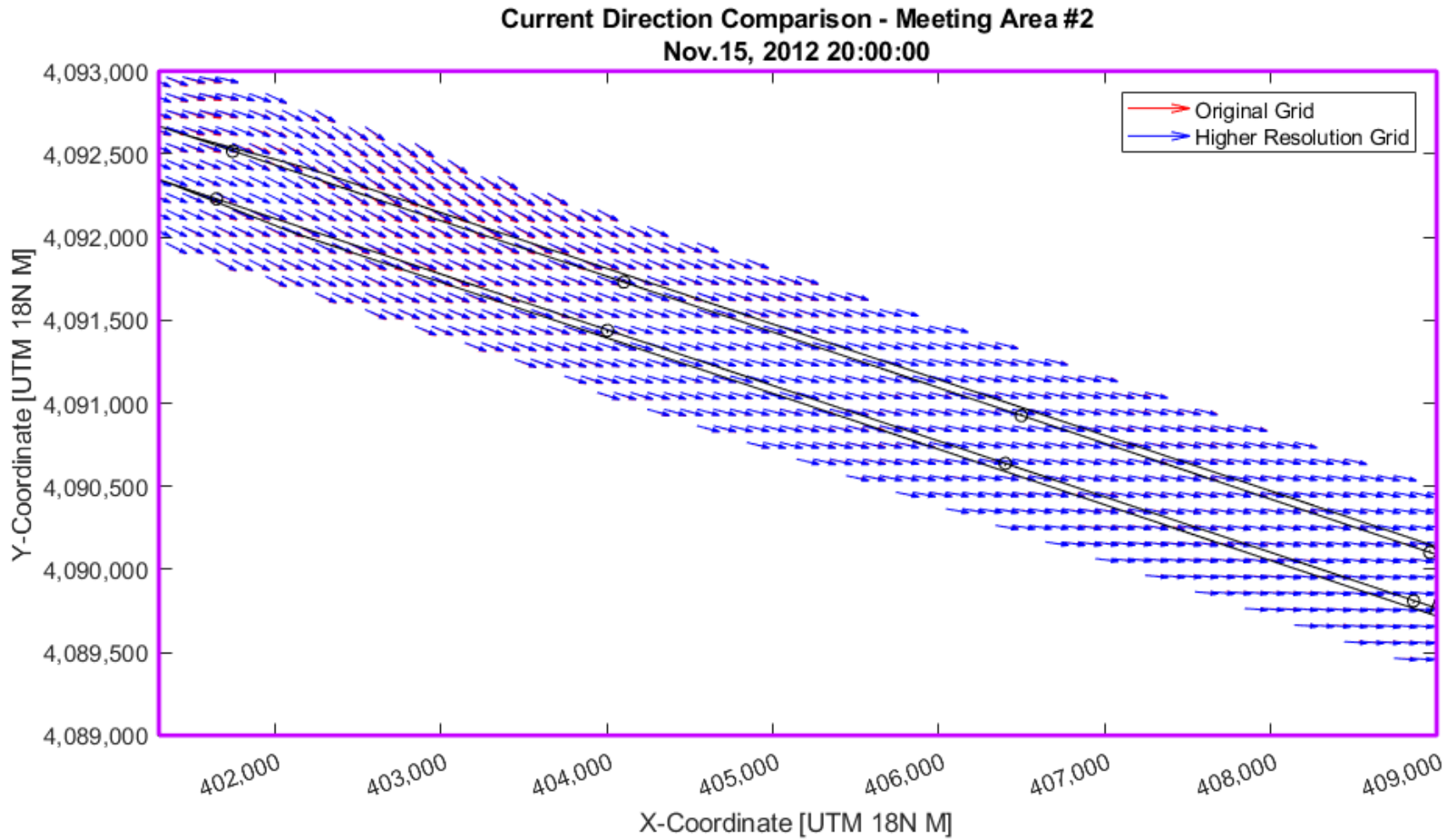
**Figure 10. Current Velocity Difference between the Higher Resolution Grid and the Original Grid in Newport News Channel during Flood Current.**



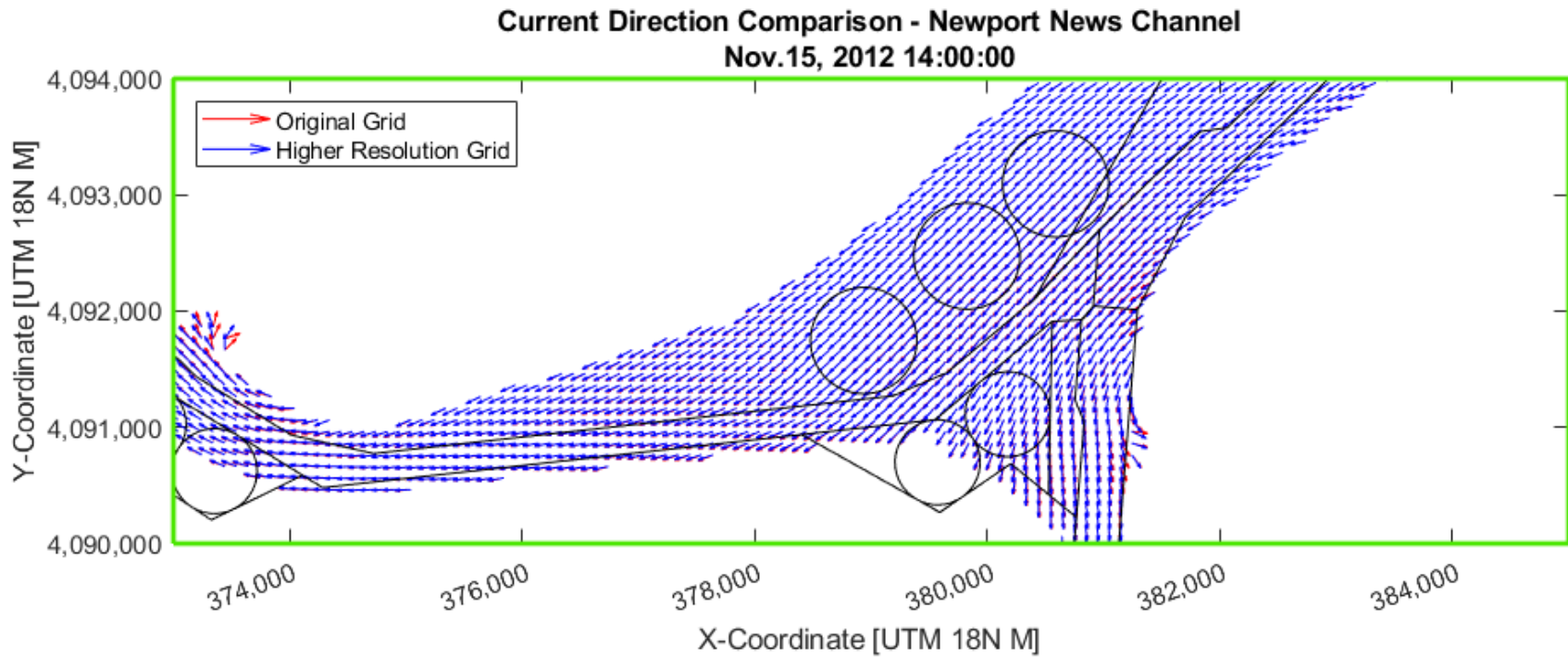
**Figure 11. Current Velocity Difference between the Higher Resolution Grid and the Original Grid in Newport News Channel during Ebb Current.**



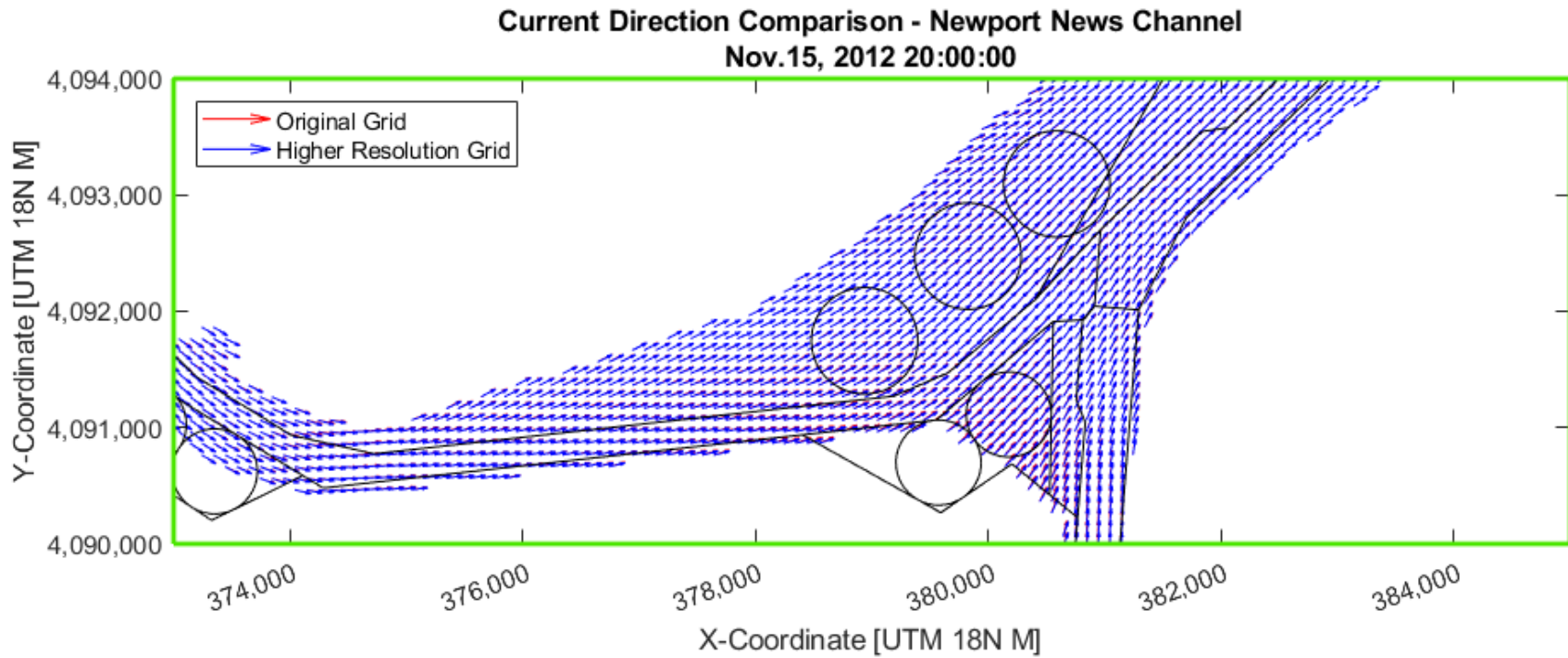
**Figure 12. Current Direction Vectors for the Original Grid and High Resolution Grid in Meeting Area #2 Interpreted to the Same Points for Flood Currents**



**Figure 13. Current Direction Vectors for the Original Grid and High Resolution Grid in Meeting Area #2 Interpreted to the Same Points for Ebb Currents.**

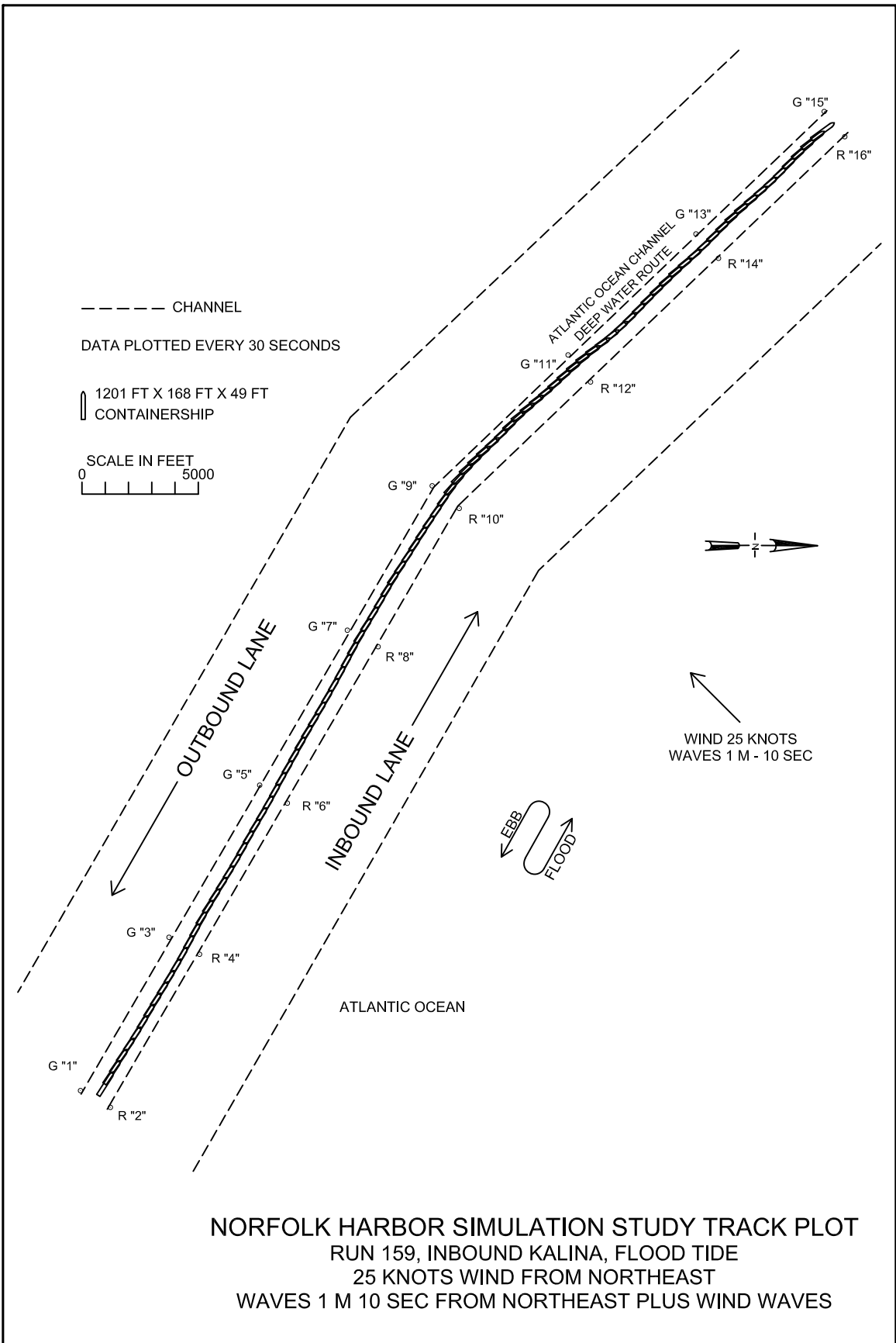


**Figure 14. Current Direction Vectors for the Original Grid and High Resolution Grid in Newport News Channel Interpreted to the Same Points for Flood Currents.**

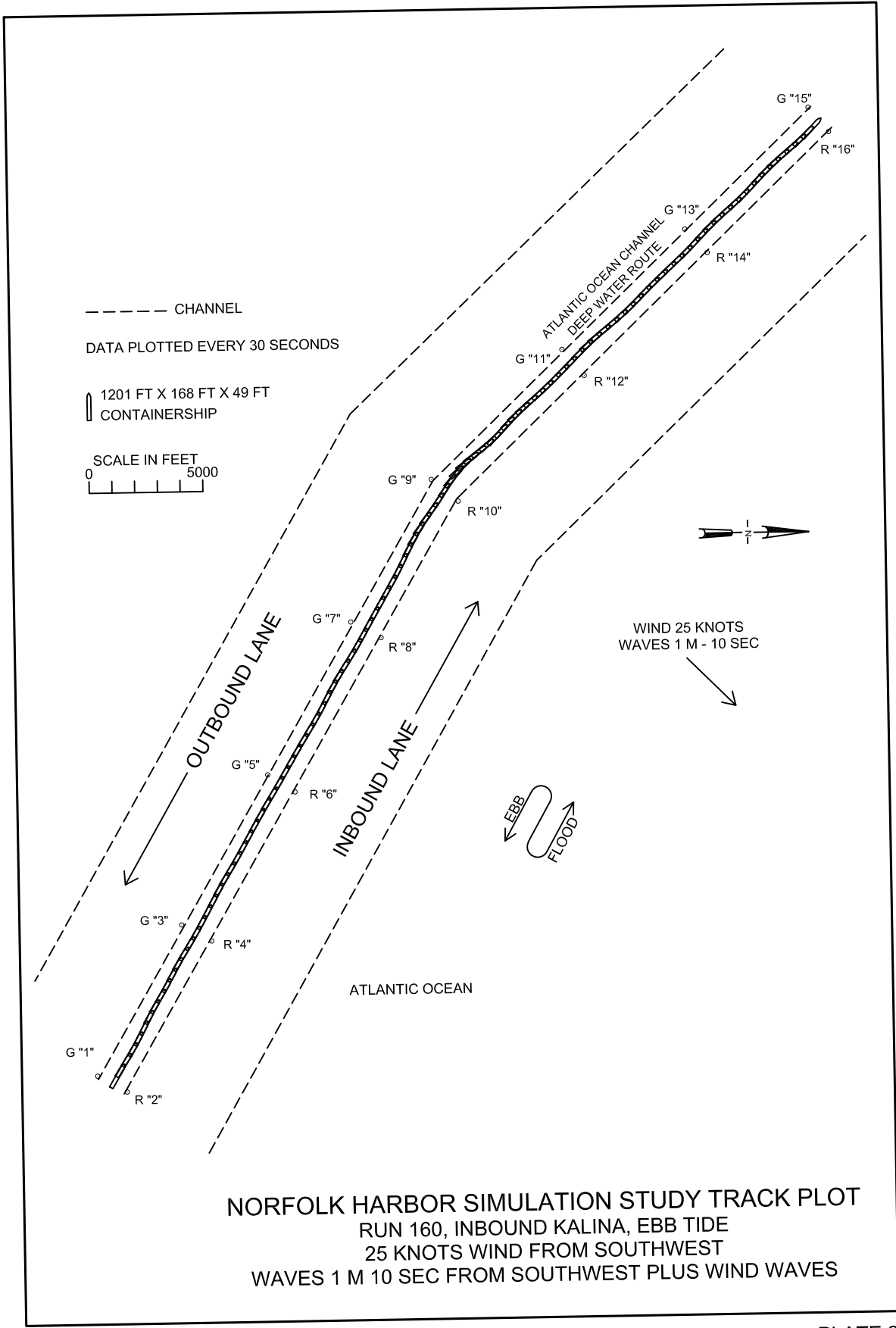


**Figure 15. Current Direction Vectors for the Original Grid and High Resolution Grid in Newport News Channel Interpreted to the Same Points for Ebb Currents.**

## **Appendix C: Vessel Track Plots**



NORFOLK HARBOR SIMULATION STUDY TRACK PLOT  
 RUN 159, INBOUND KALINA, FLOOD TIDE  
 25 KNOTS WIND FROM NORTHEAST  
 WAVES 1 M 10 SEC FROM NORTHEAST PLUS WIND WAVES



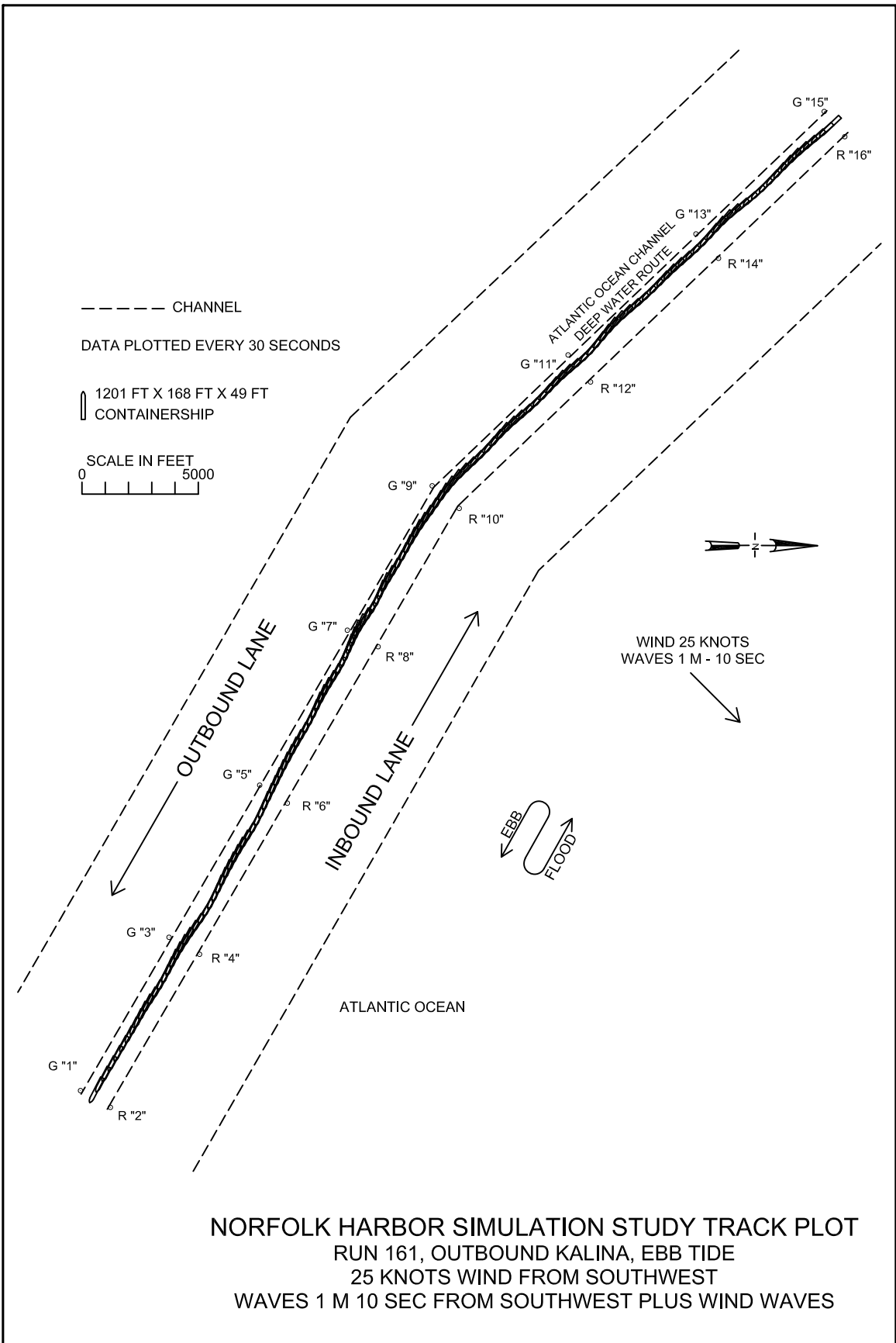
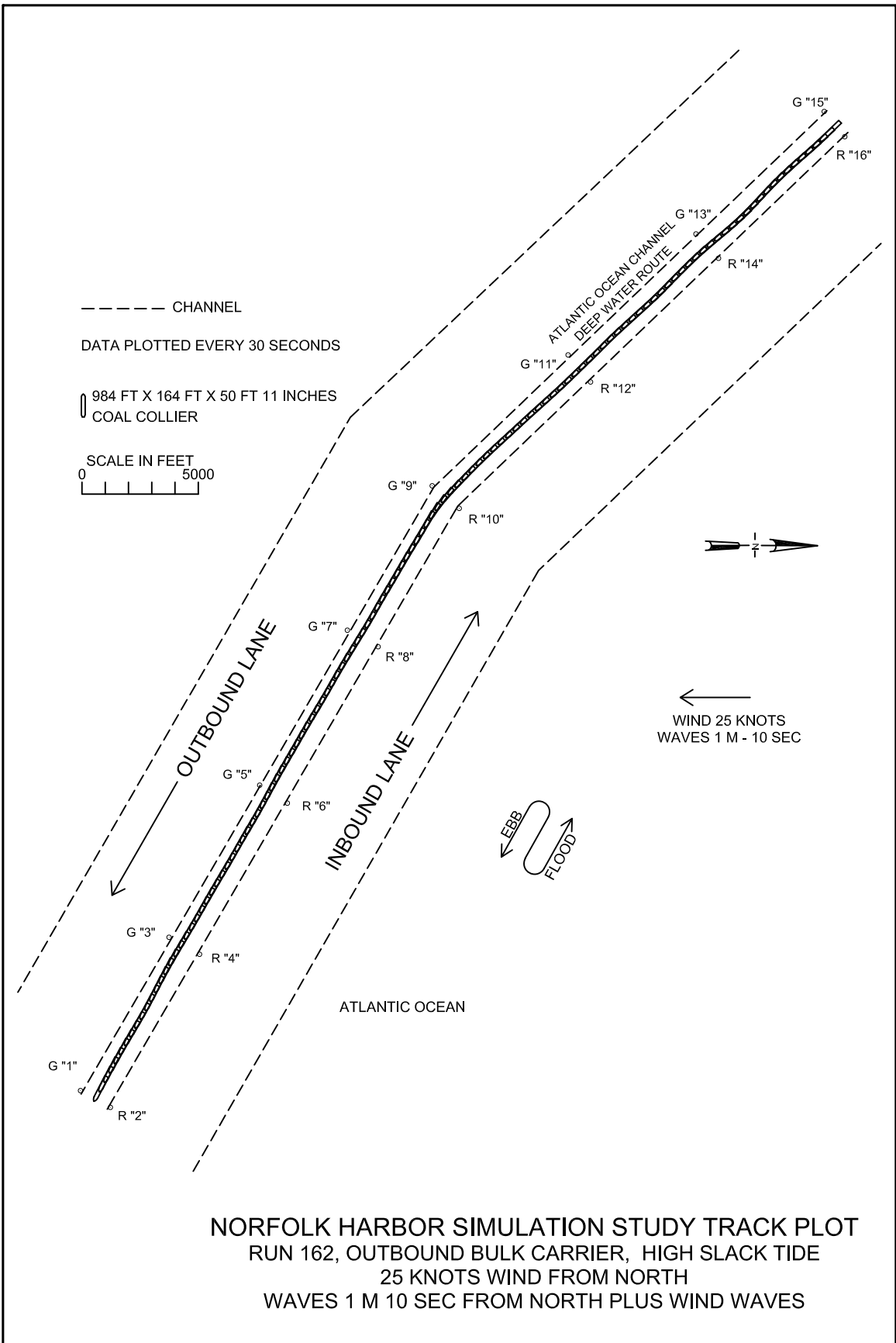


PLATE 3



NORFOLK HARBOR SIMULATION STUDY TRACK PLOT  
 RUN 162, OUTBOUND BULK CARRIER, HIGH SLACK TIDE  
 25 KNOTS WIND FROM NORTH  
 WAVES 1 M 10 SEC FROM NORTH PLUS WIND WAVES

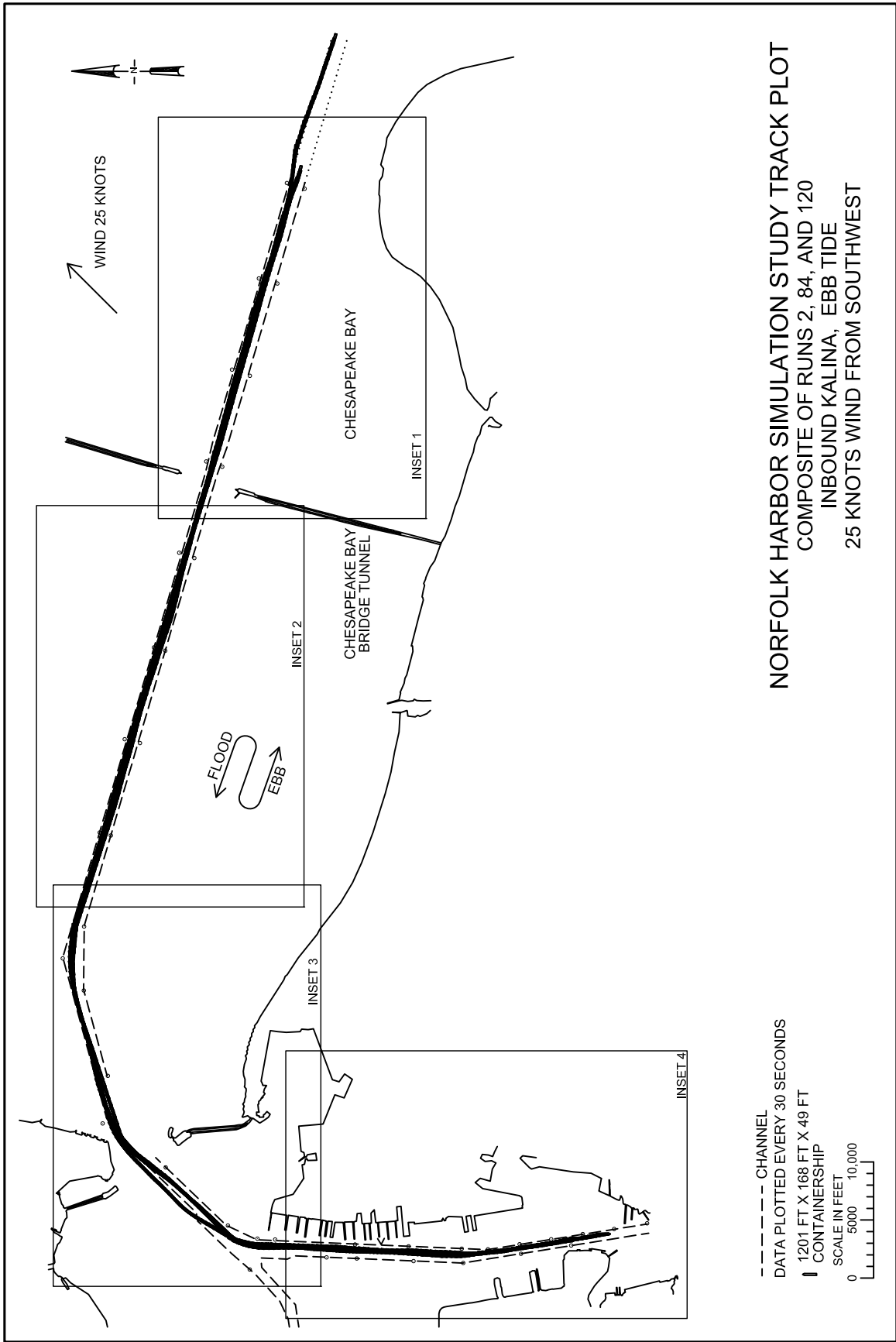
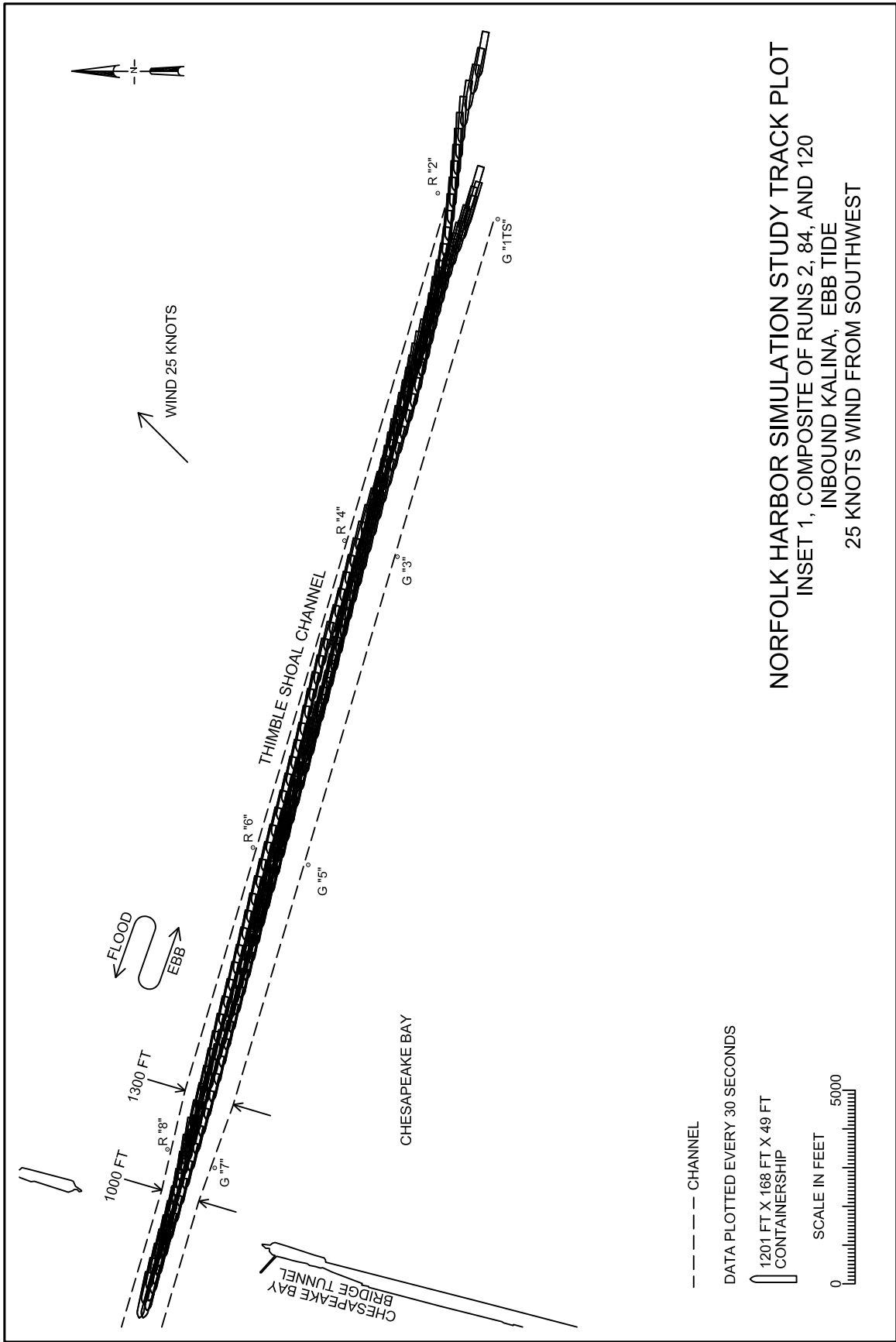
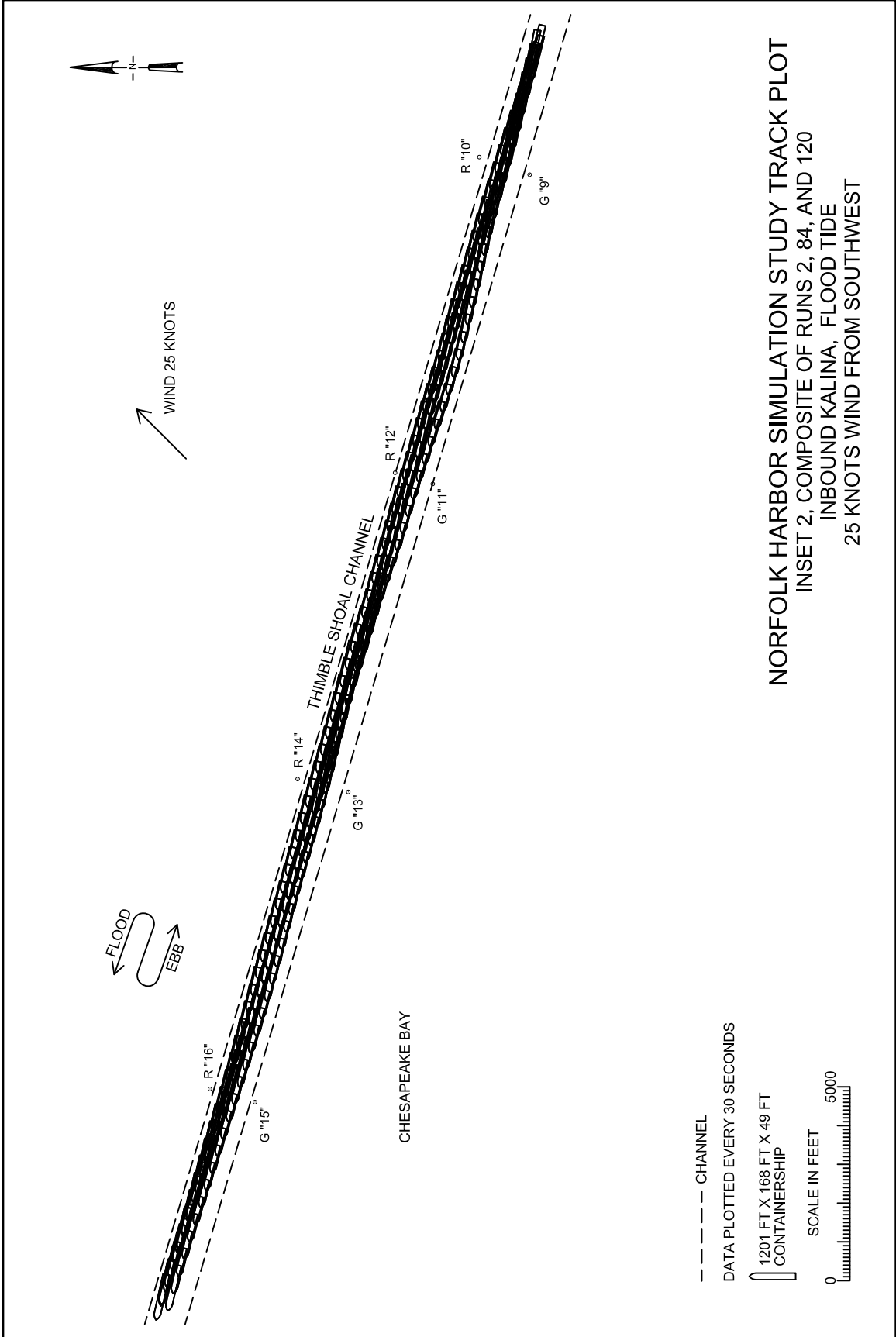


PLATE 5



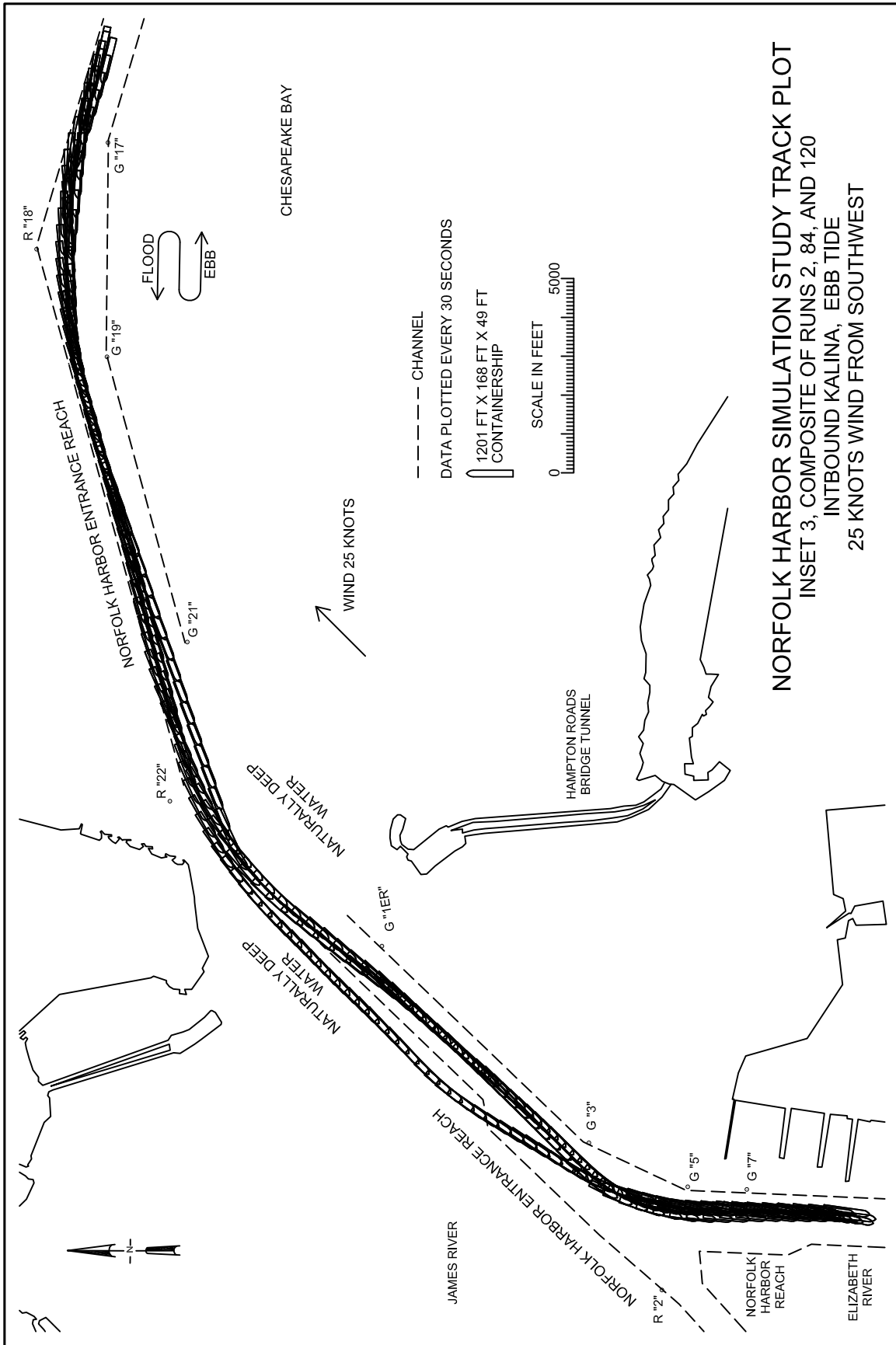
**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
**INSET 1, COMPOSITE OF RUNS 2, 84, AND 120**  
**INBOUND KALINA, EBB TIDE**  
**25 KNOTS WIND FROM SOUTHWEST**

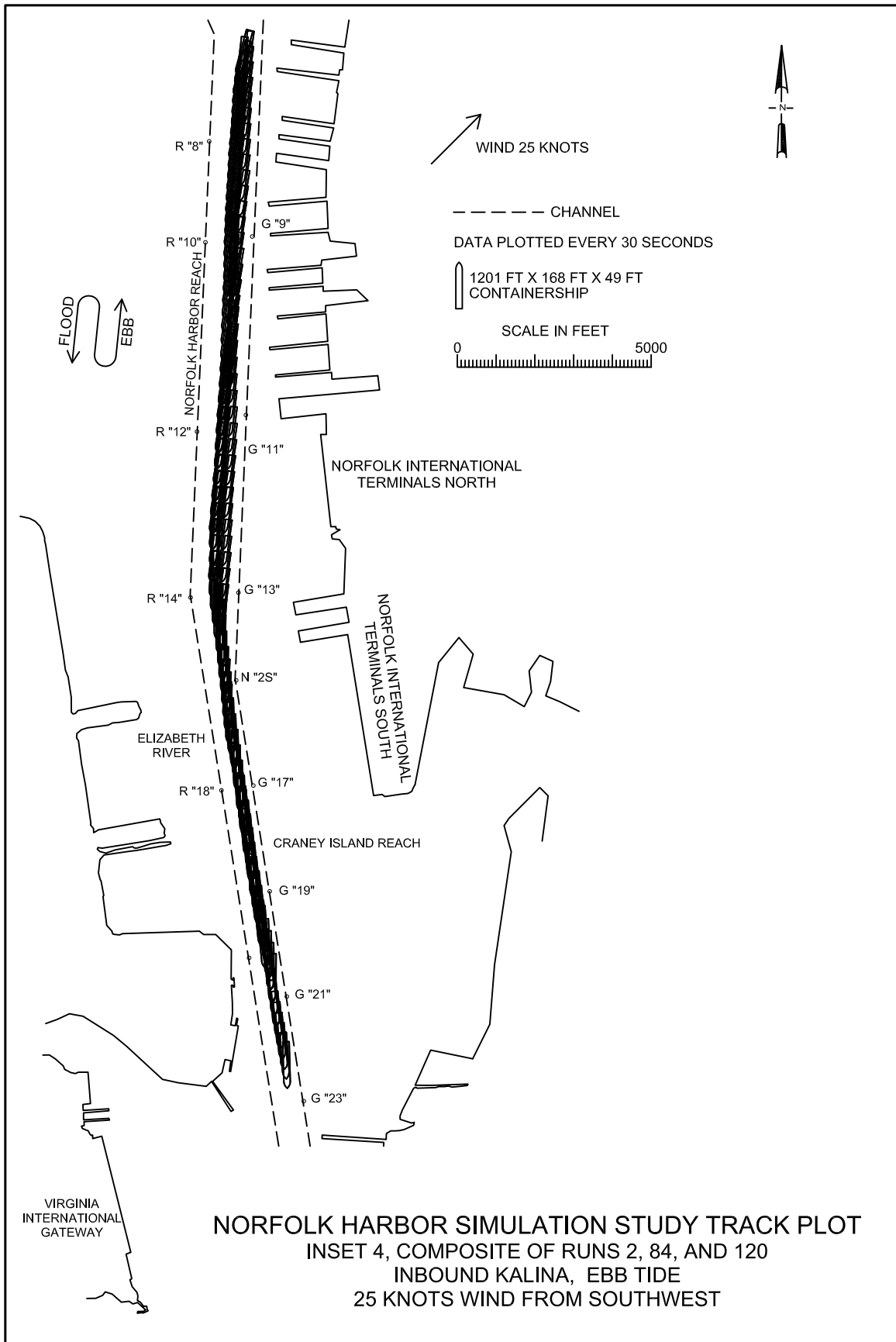
--- CHANNEL  
 DATA PLOTTED EVERY 30 SECONDS  
 1201 FT X 168 FT X 49 FT CONTAINERSHIP  
 SCALE IN FEET 5000

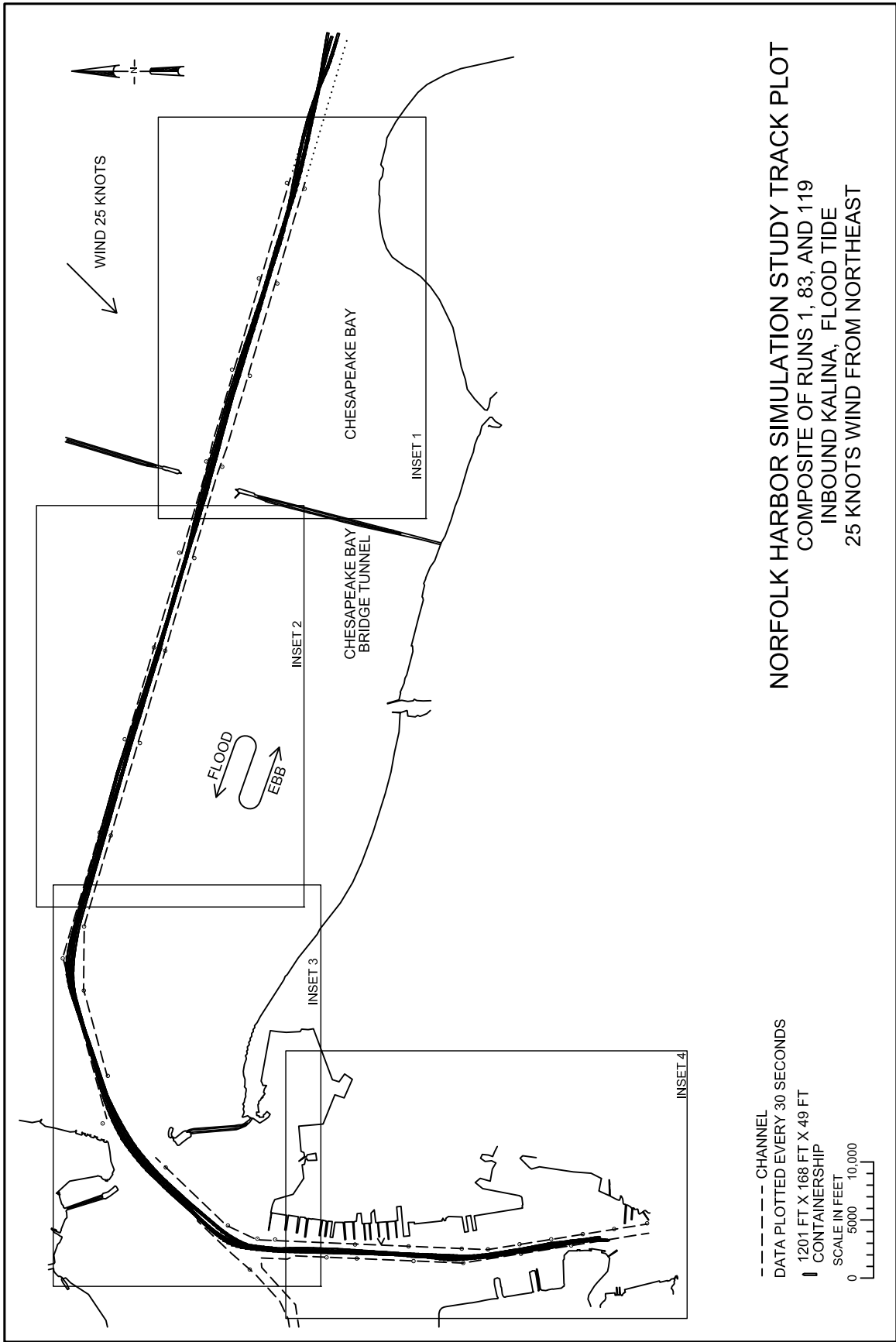


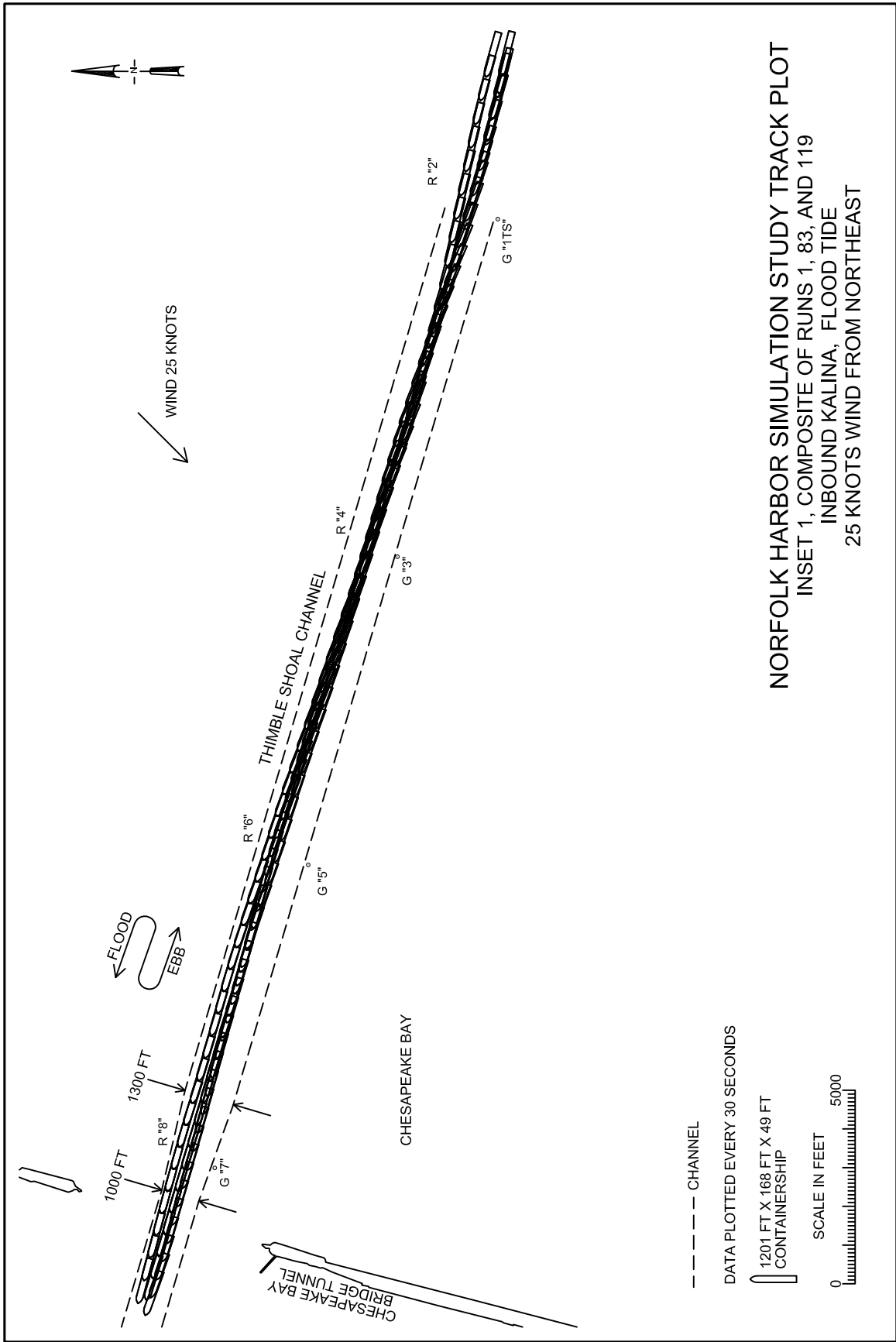
**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 INSET 2, COMPOSITE OF RUNS 2, 84, AND 120  
 INBOUND KALINA, FLOOD TIDE  
 25 KNOTS WIND FROM SOUTHWEST

PLATE 7

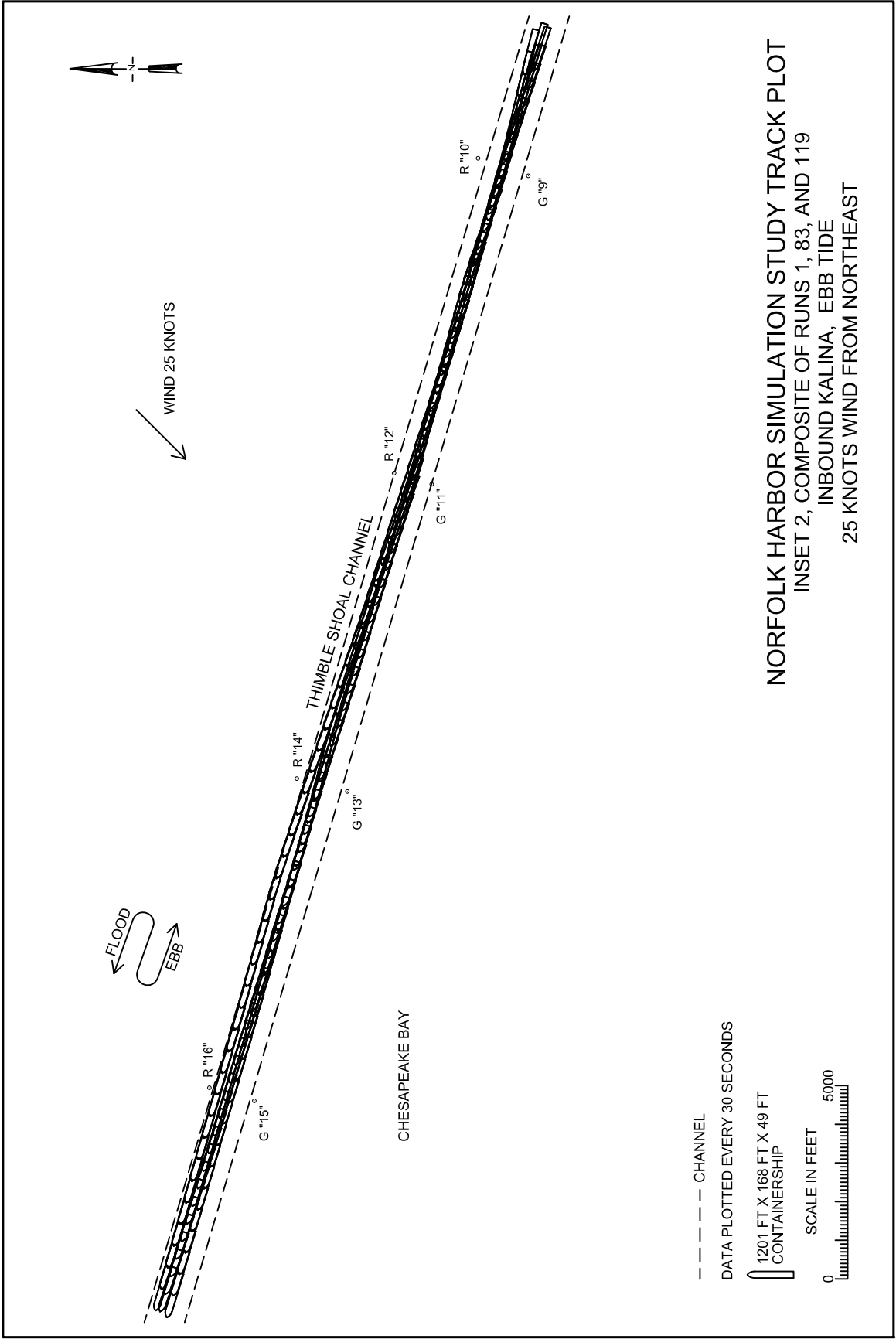








**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 INSET 1, COMPOSITE OF RUNS 1, 83, AND 119  
 INBOUND KALINA, FLOOD TIDE  
 25 KNOTS WIND FROM NORTHEAST



**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 INSET 2, COMPOSITE OF RUNS 1, 83, AND 119  
 INBOUND KALINA, EBB TIDE  
 25 KNOTS WIND FROM NORTHEAST

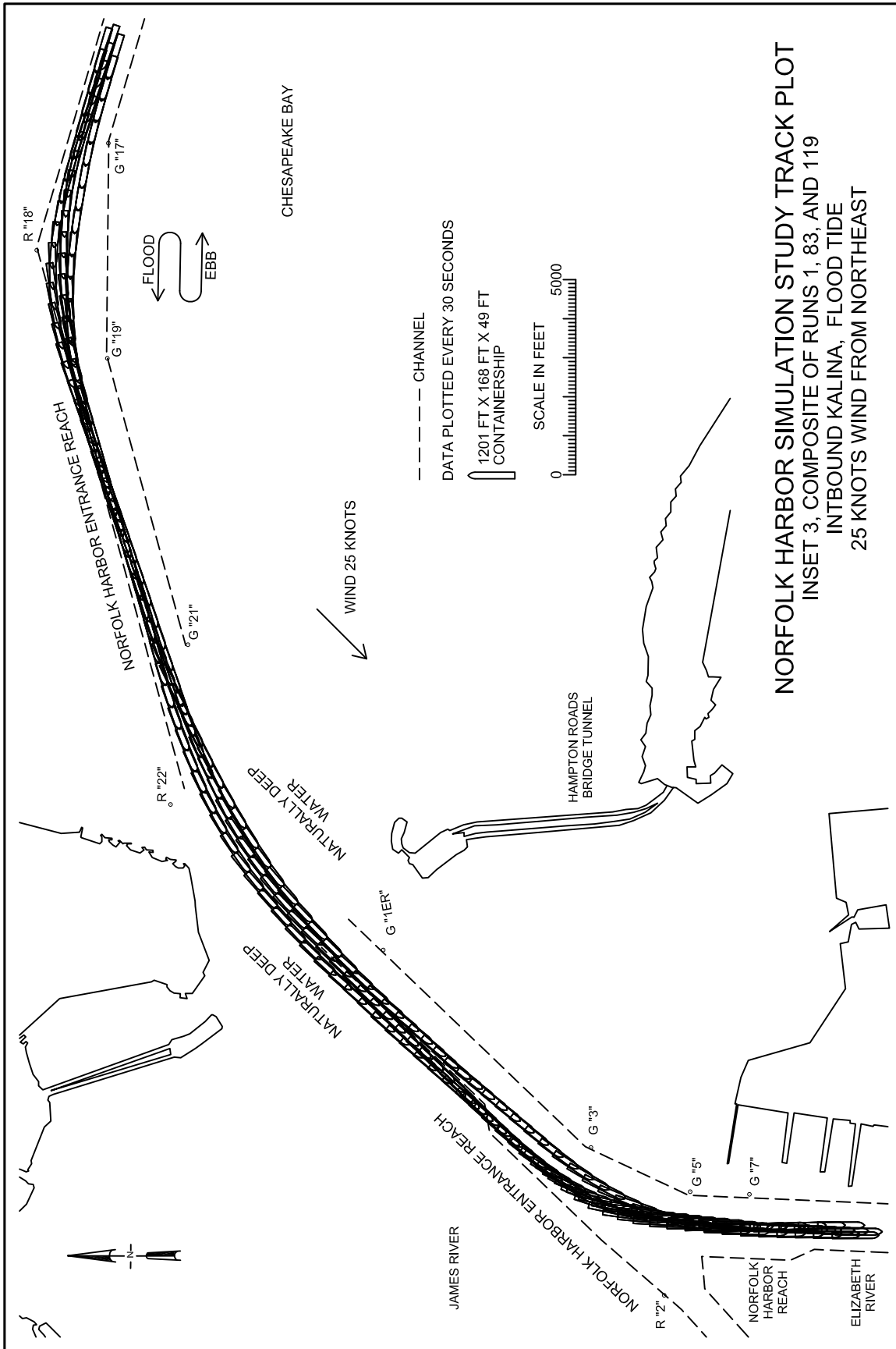
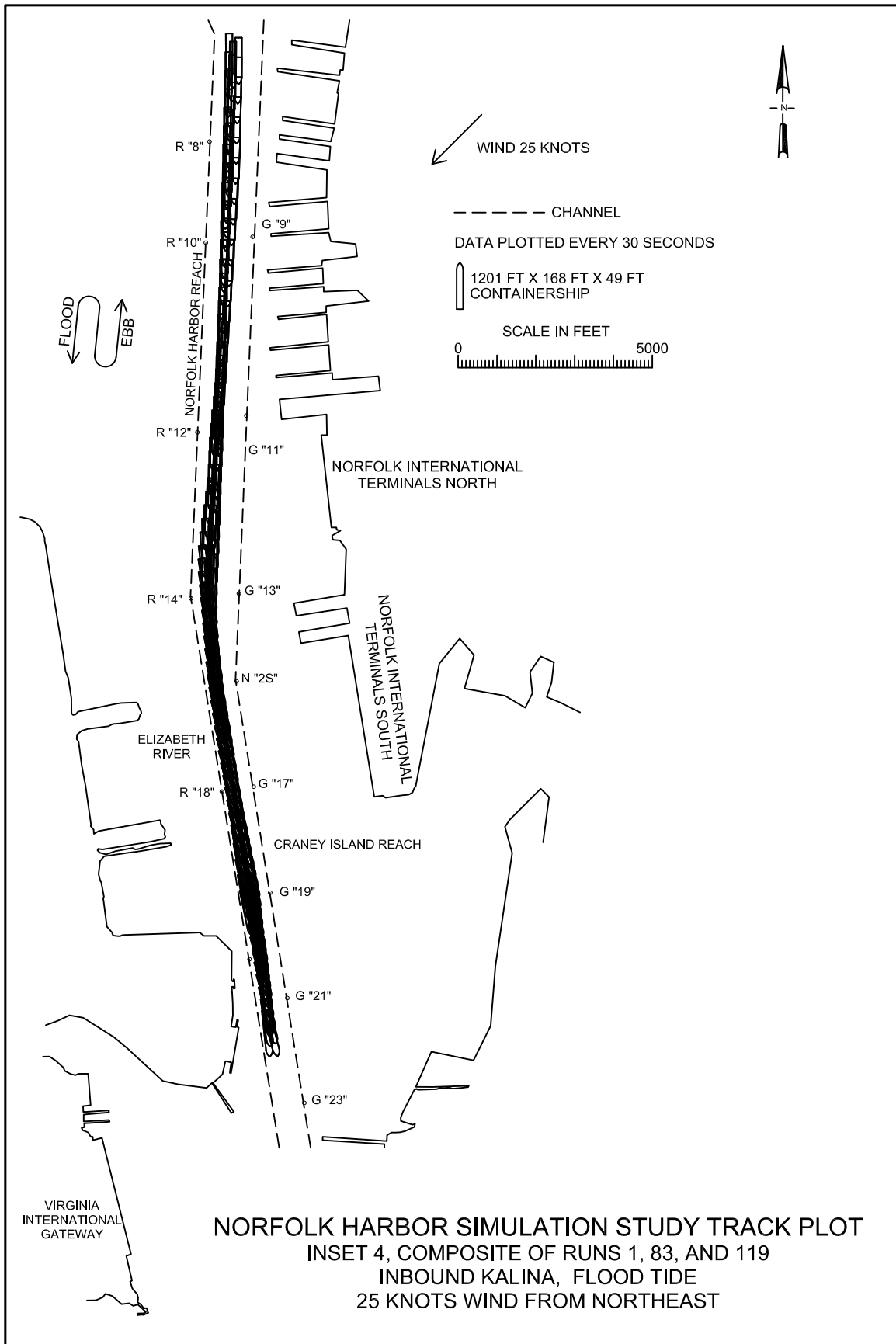
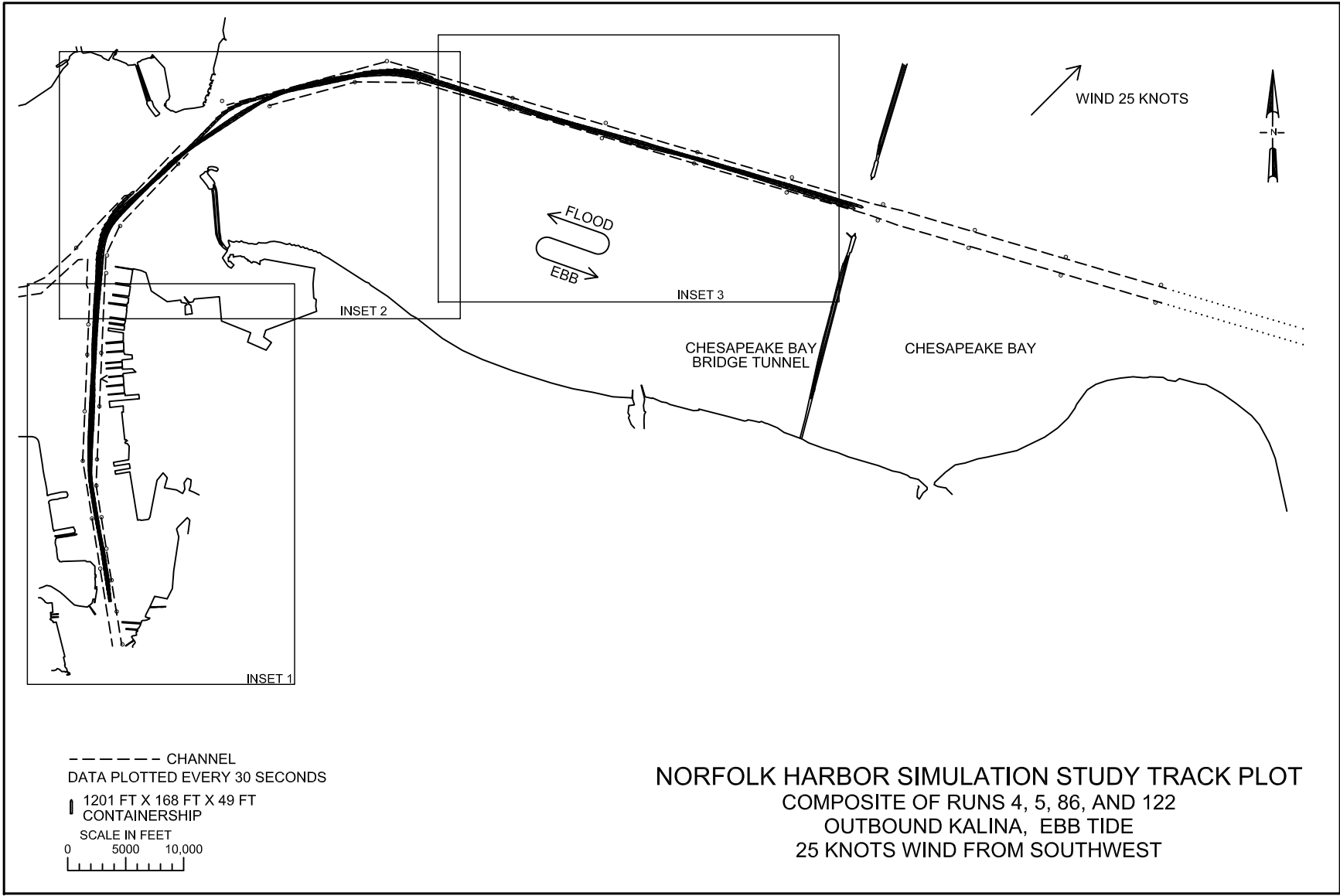
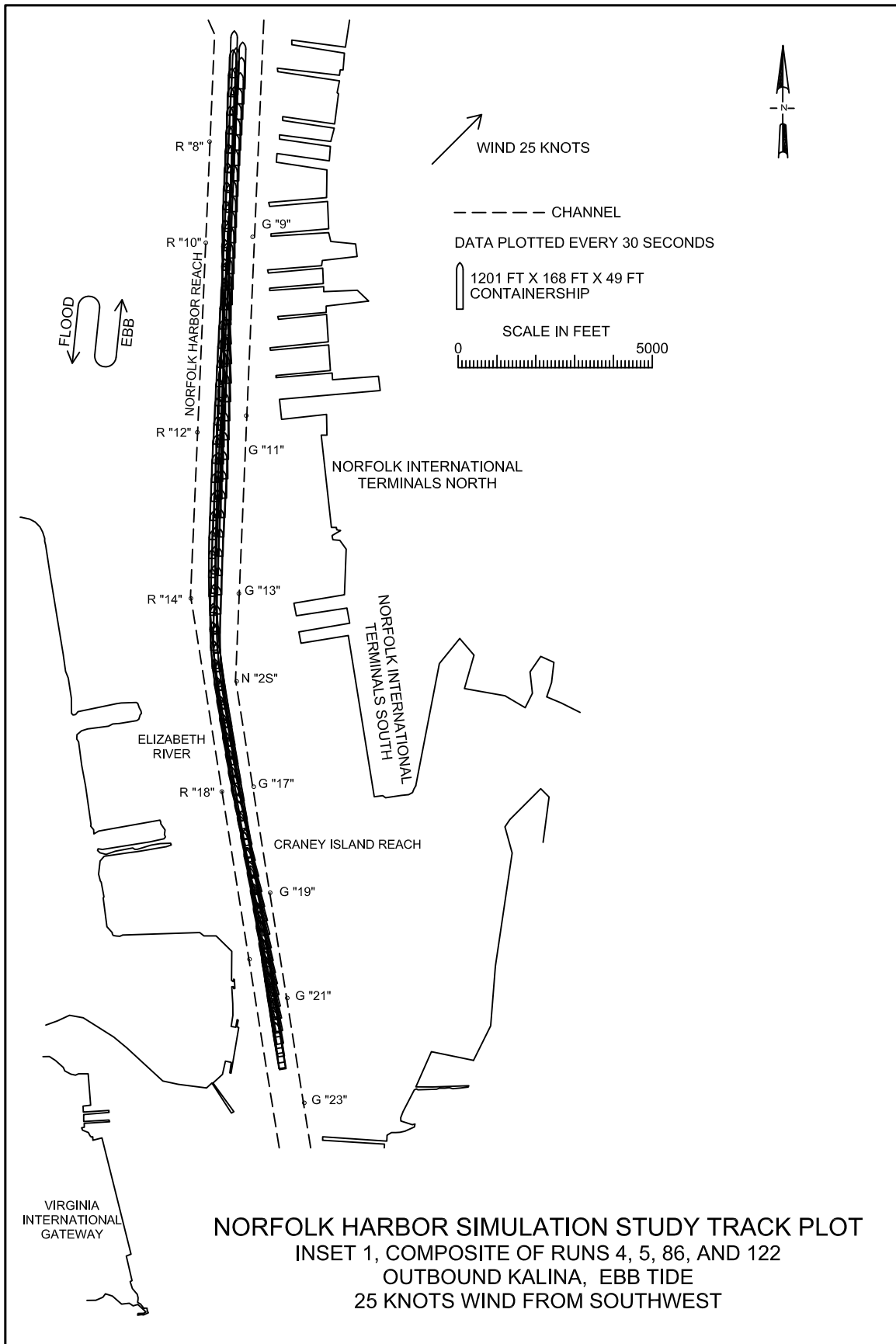


PLATE 13







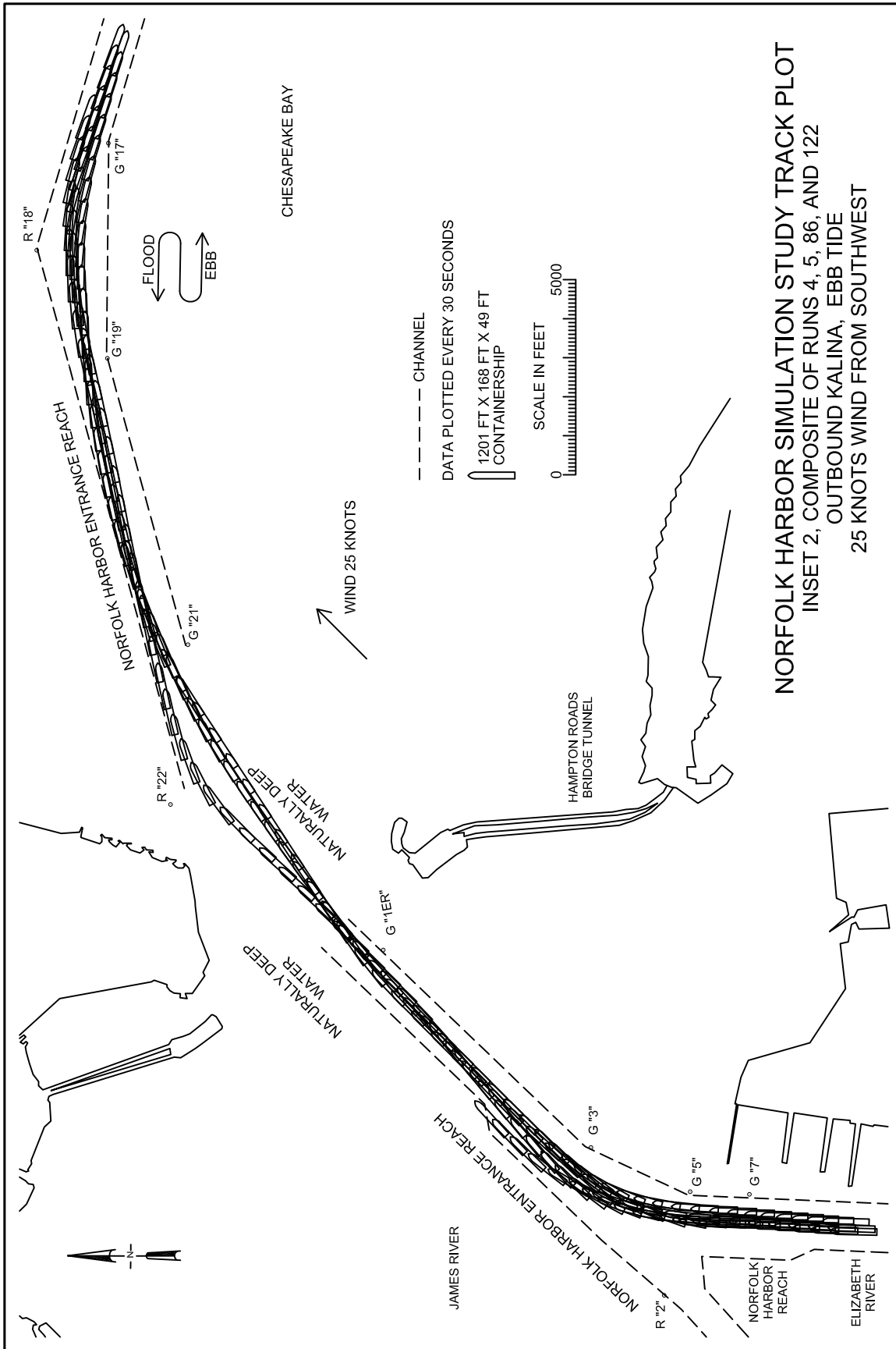
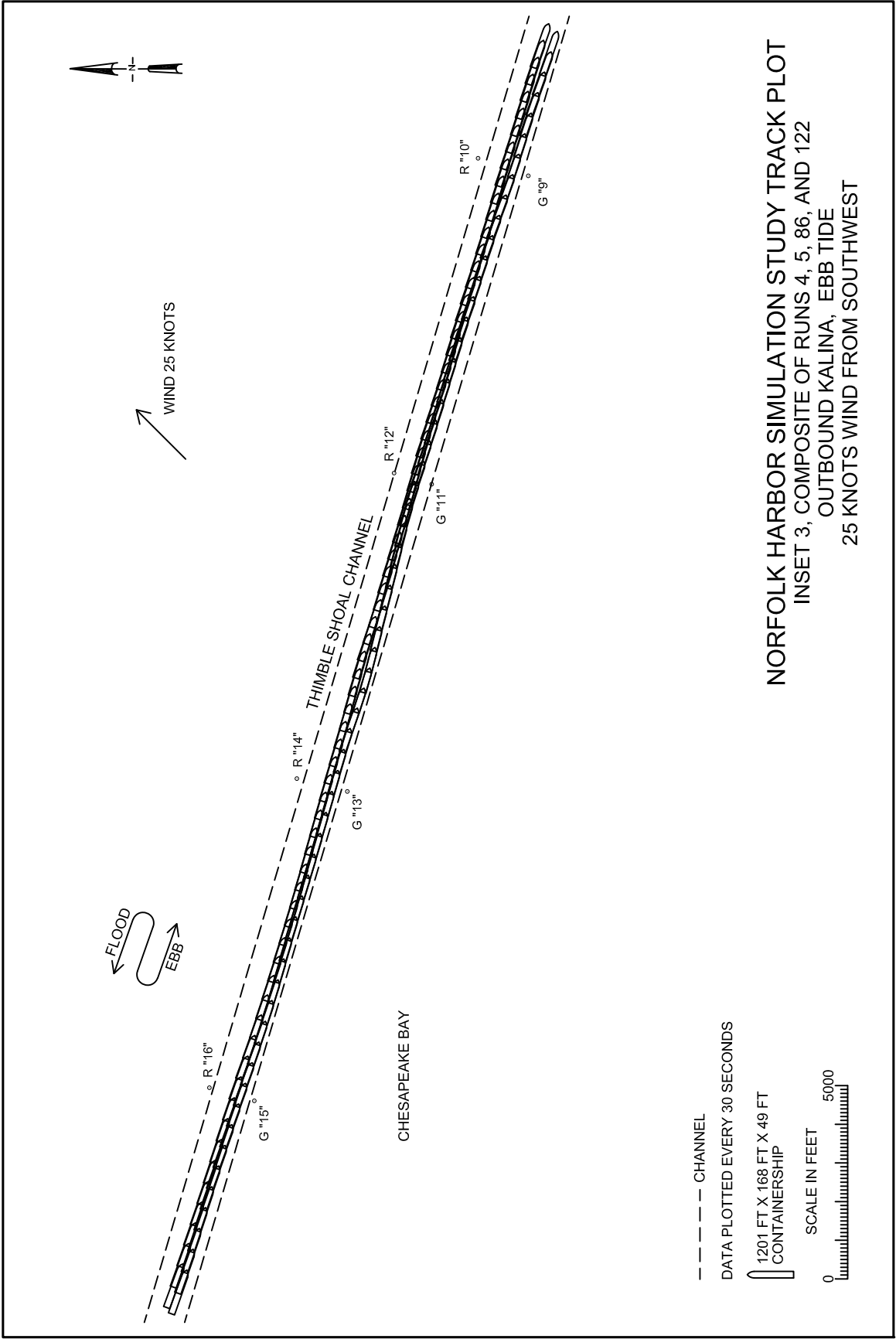


PLATE 17



**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
**INSET 3, COMPOSITE OF RUNS 4, 5, 86, AND 122**  
**OUTBOUND KALINA, EBB TIDE**  
**25 KNOTS WIND FROM SOUTHWEST**

--- CHANNEL  
 DATA PLOTTED EVERY 30 SECONDS  
 1201 FT X 168 FT X 49 FT  
 CONTAINERSHIP  
 SCALE IN FEET 5000

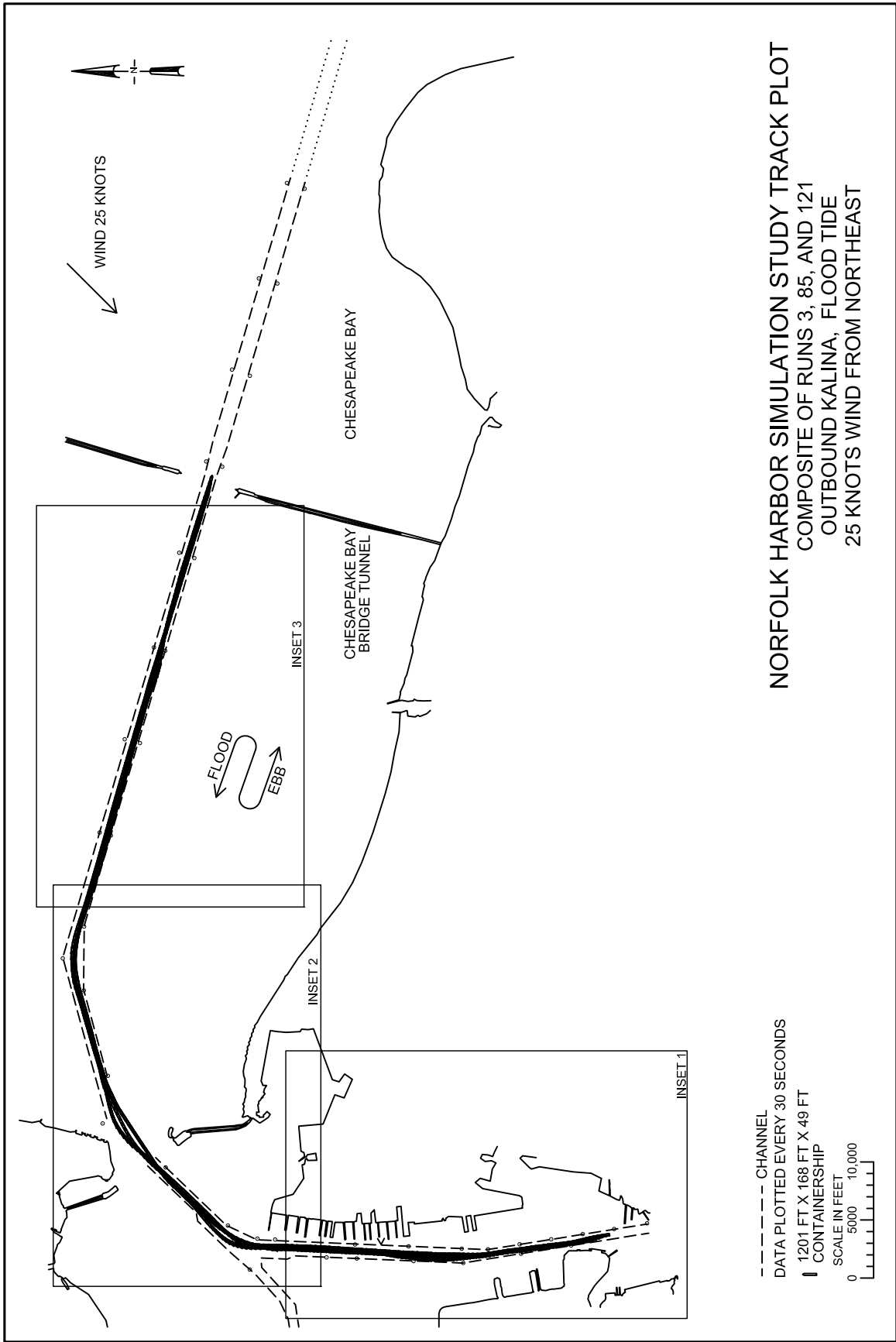
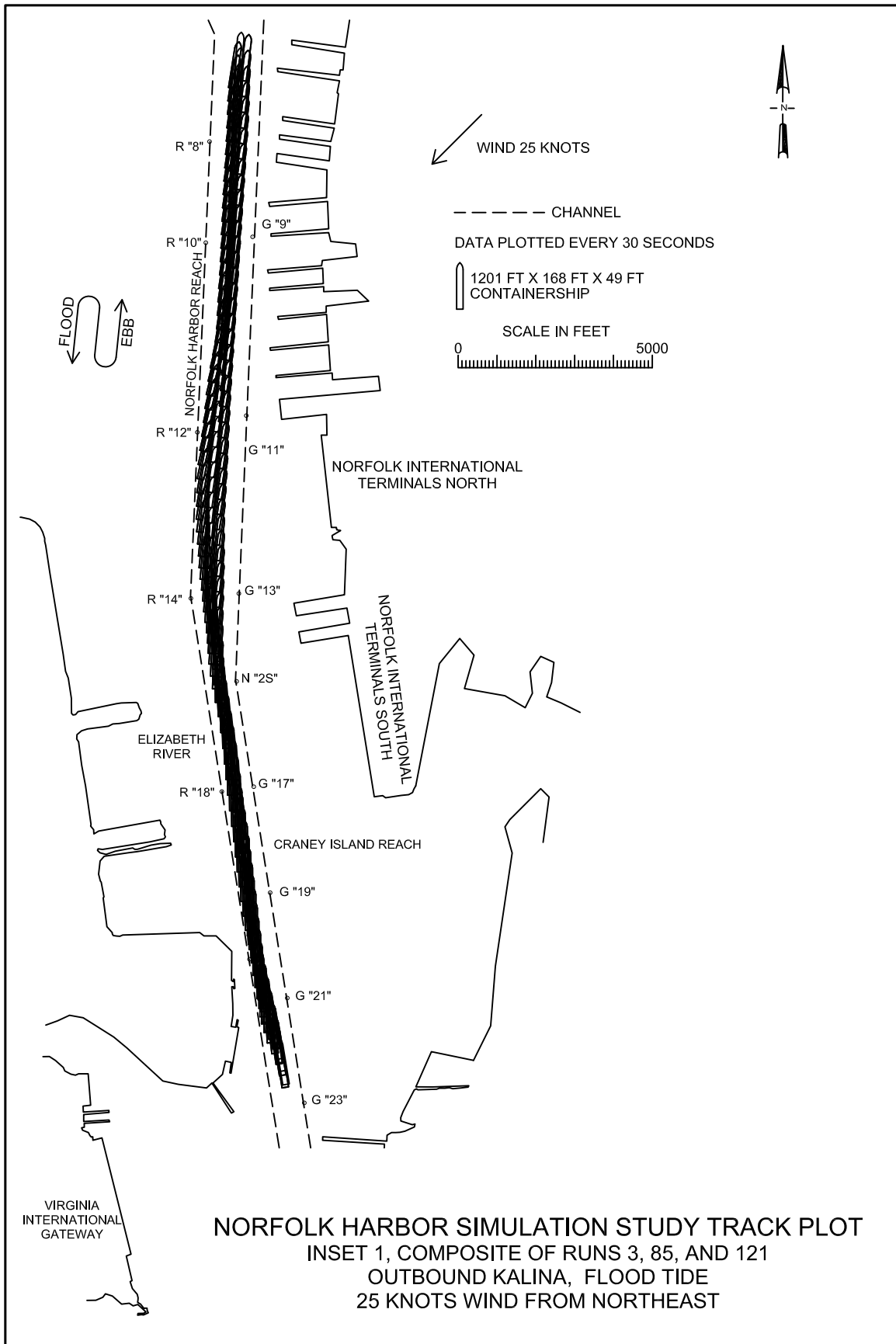


PLATE 19



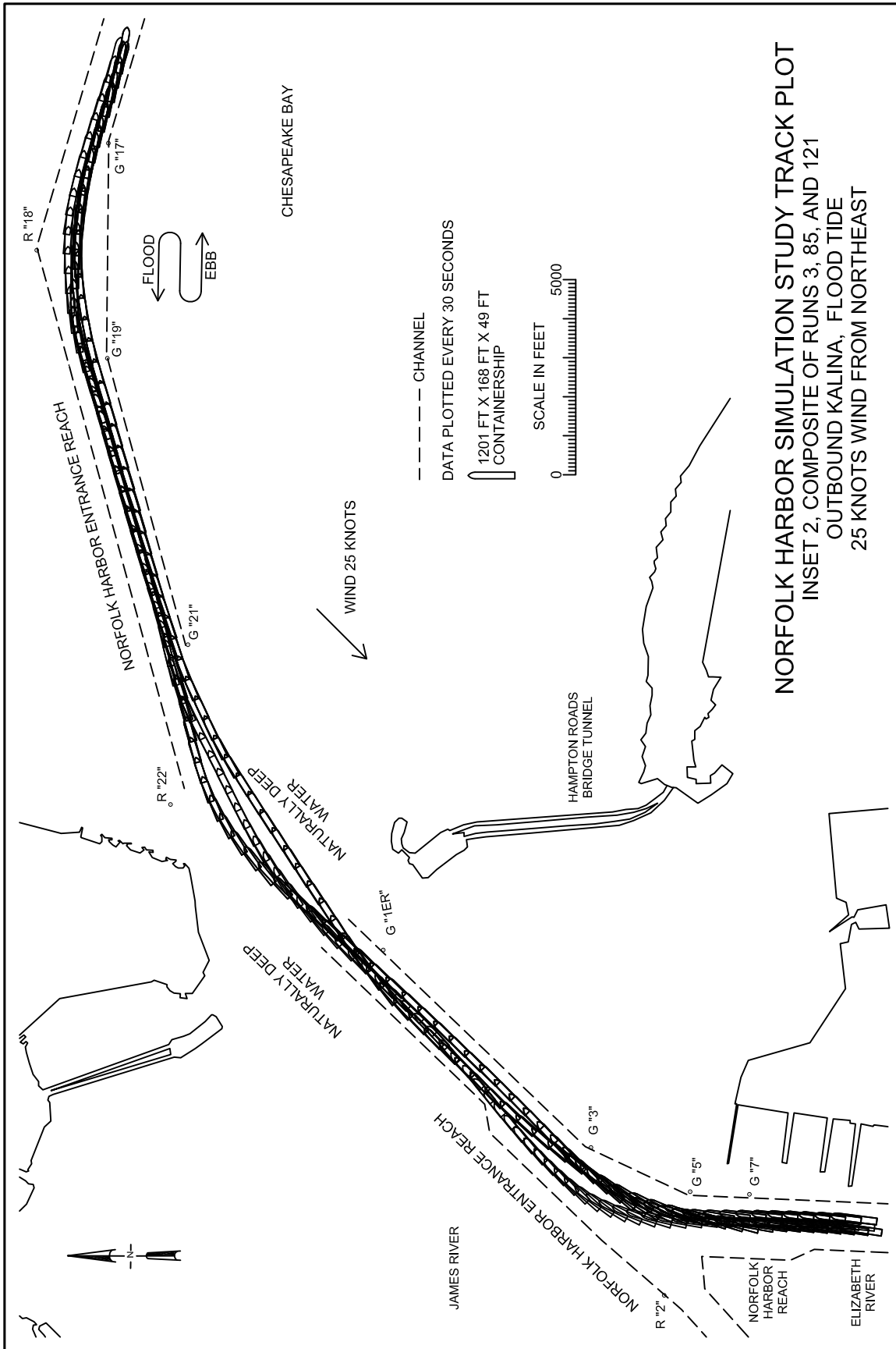
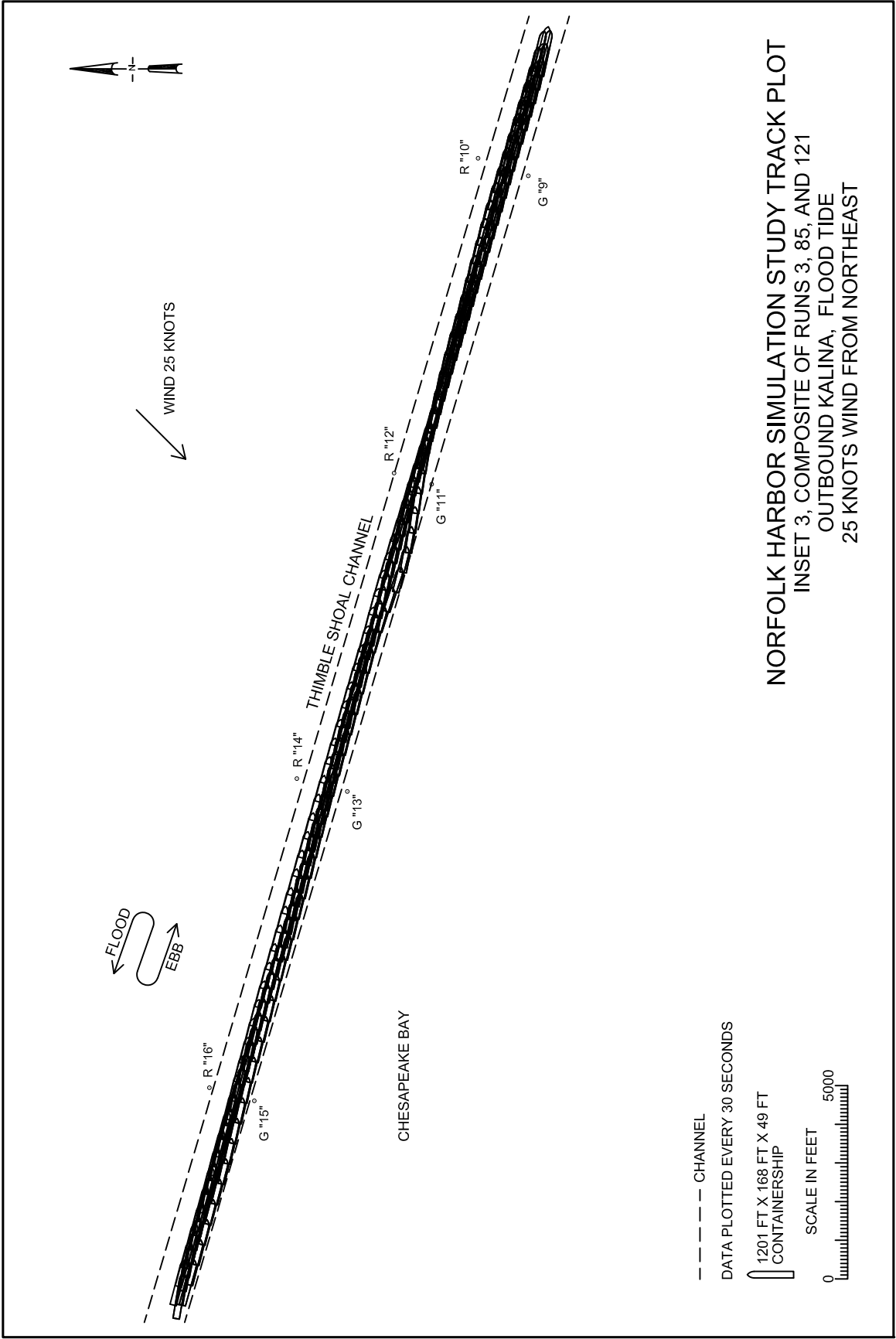


PLATE 21



NORFOLK HARBOR SIMULATION STUDY TRACK PLOT  
 INSET 3, COMPOSITE OF RUNS 3, 85, AND 121  
 OUTBOUND KALINA, FLOOD TIDE  
 25 KNOTS WIND FROM NORTHEAST

--- CHANNEL  
 DATA PLOTTED EVERY 30 SECONDS  
 1201 FT X 168 FT X 49 FT  
 CONTAINERSHIP  
 SCALE IN FEET 5000

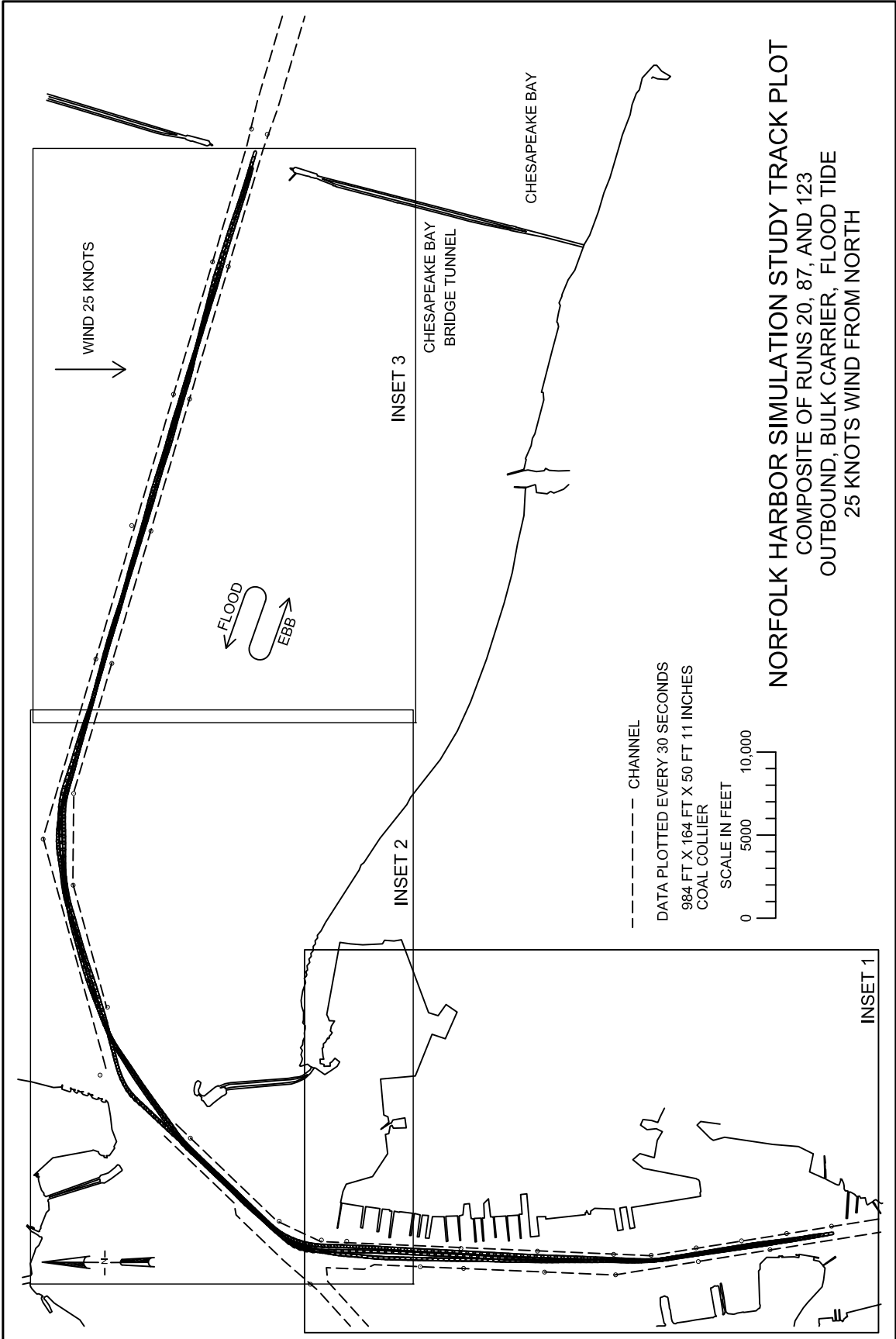
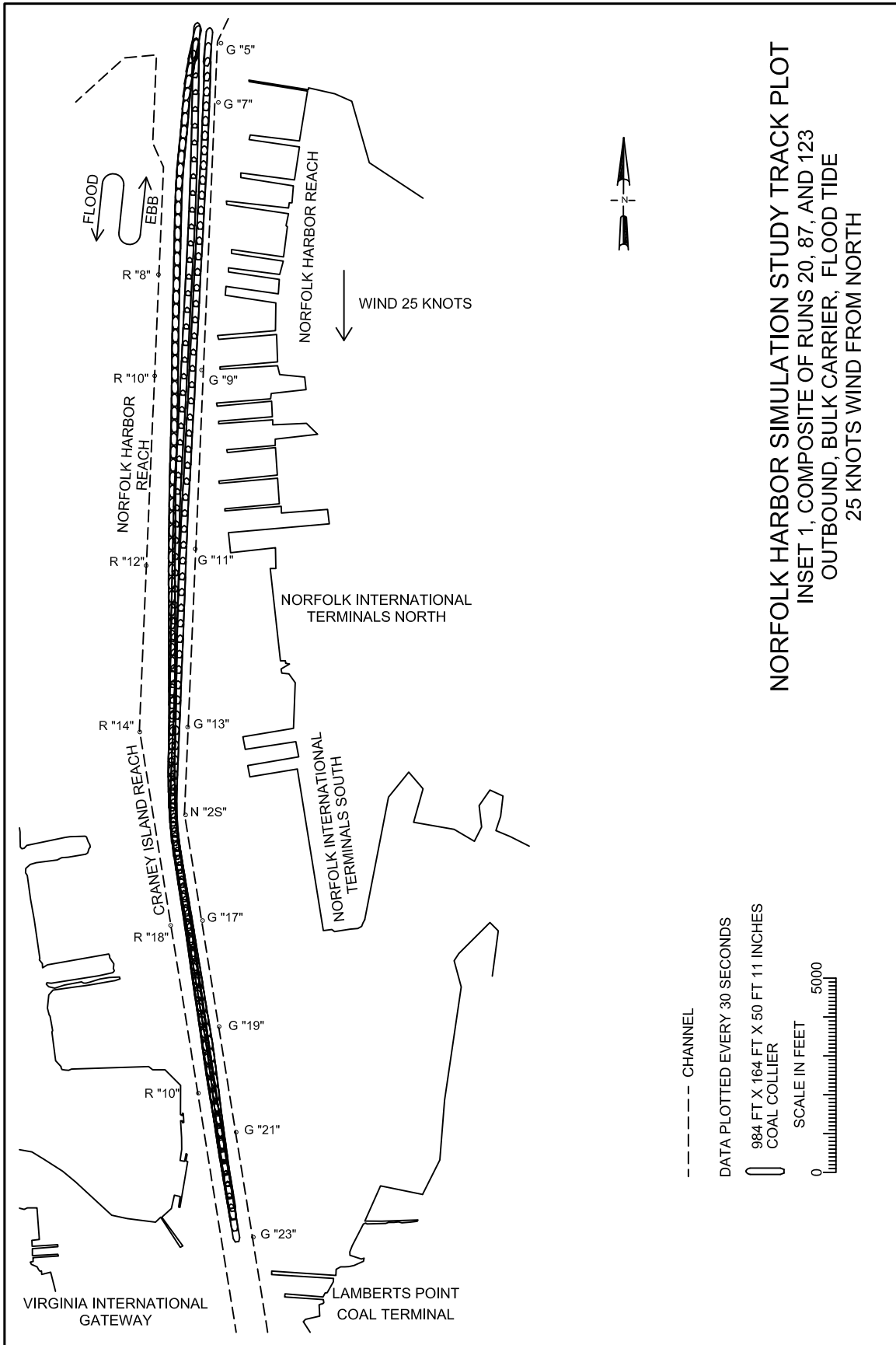


PLATE 23



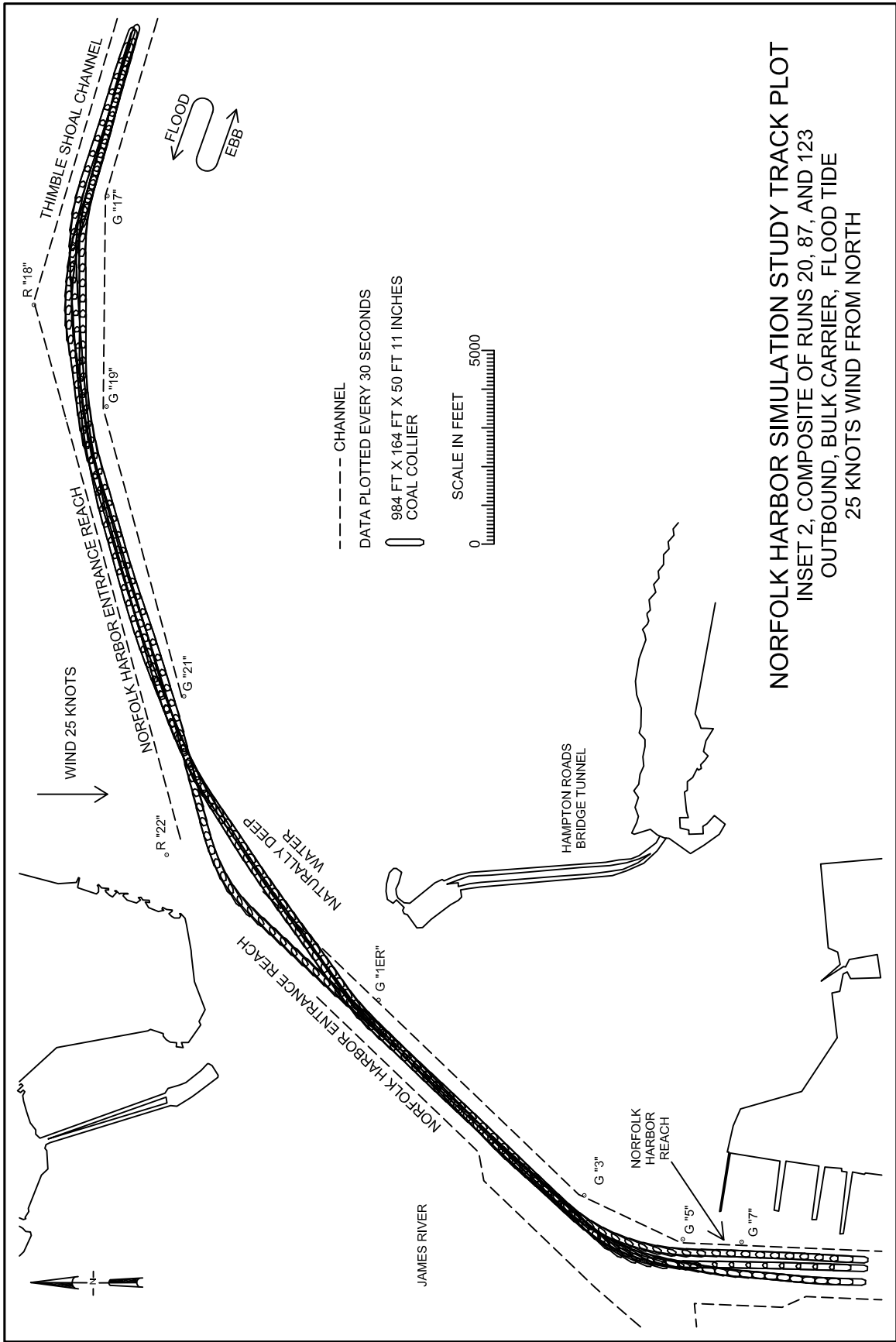
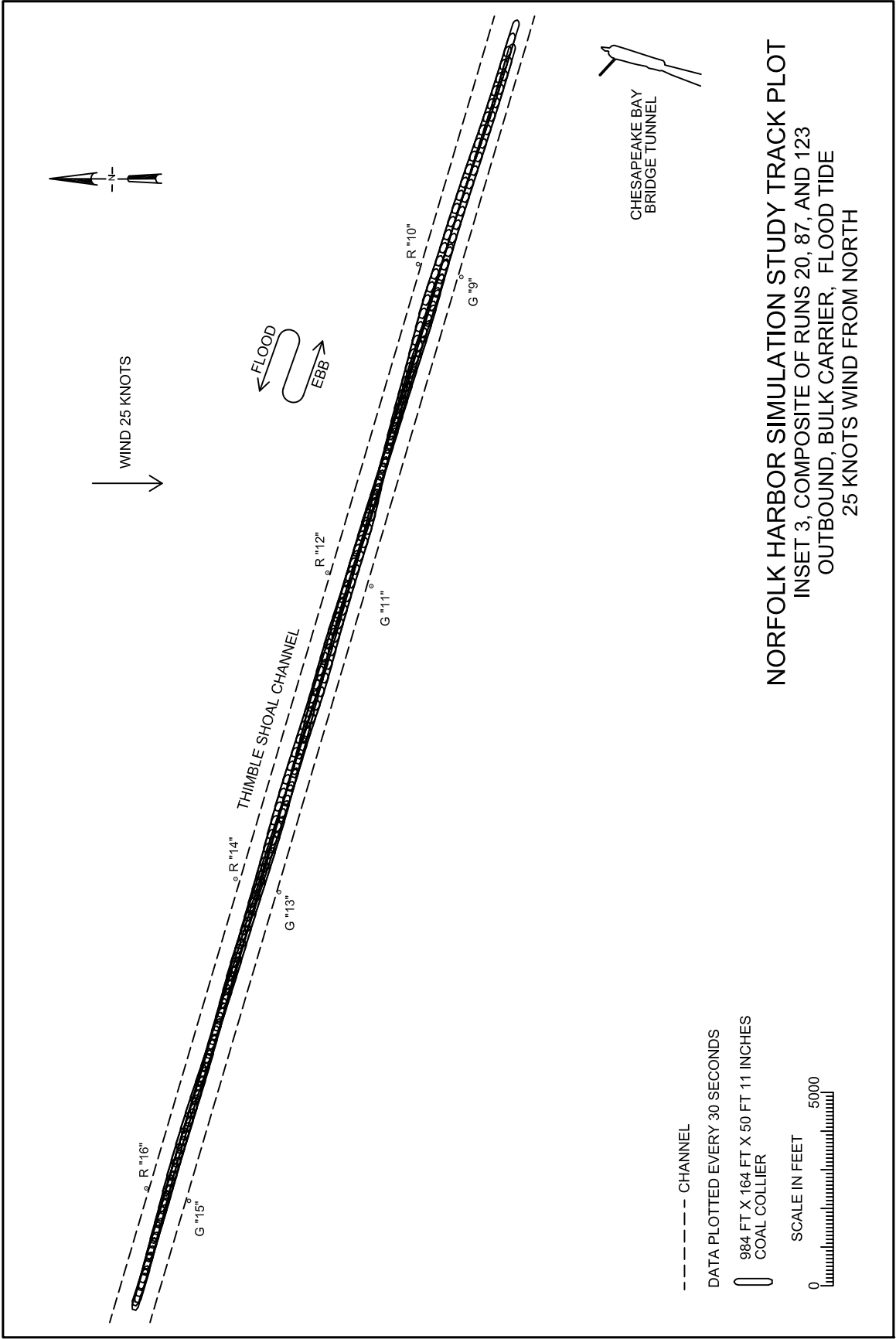


PLATE 25



NORFOLK HARBOR SIMULATION STUDY TRACK PLOT  
 INSET 3, COMPOSITE OF RUNS 20, 87, AND 123  
 OUTBOUND, BULK CARRIER, FLOOD TIDE  
 25 KNOTS WIND FROM NORTH



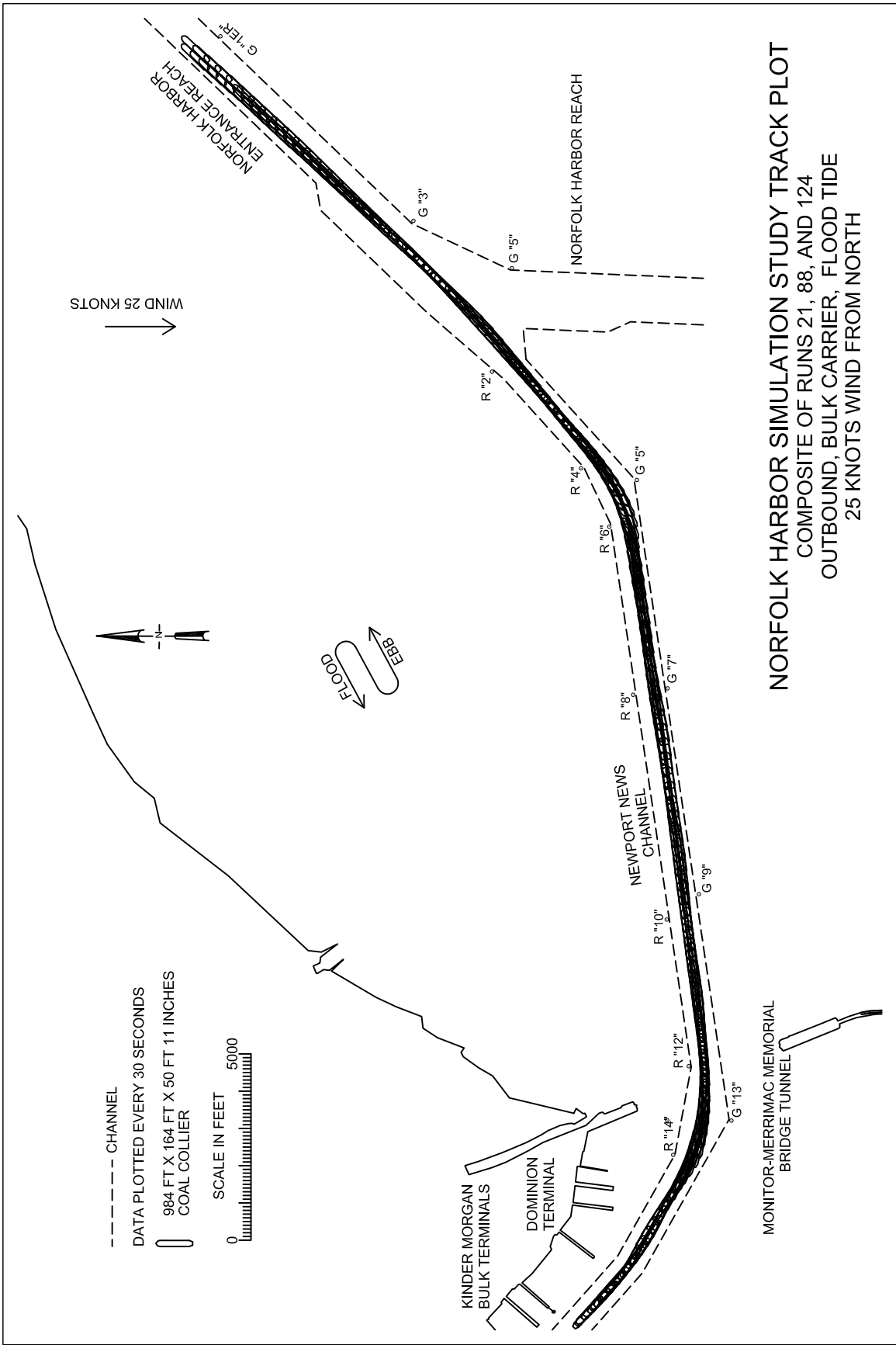
CHESAPEAKE BAY  
 BRIDGE TUNNEL

--- CHANNEL

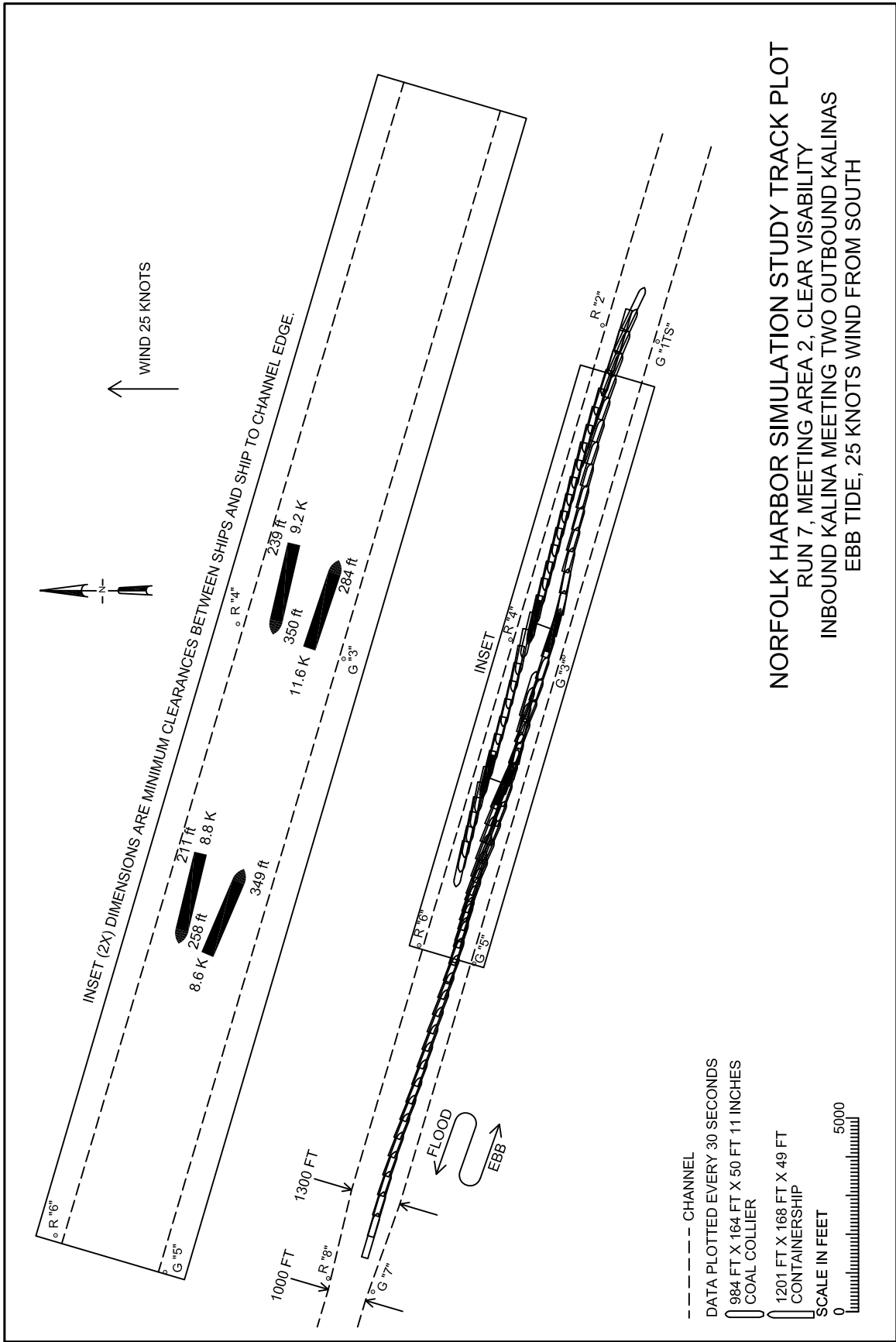
DATA PLOTTED EVERY 30 SECONDS

984 FT X 164 FT X 50 FT 11 INCHES  
 COAL COLLIER

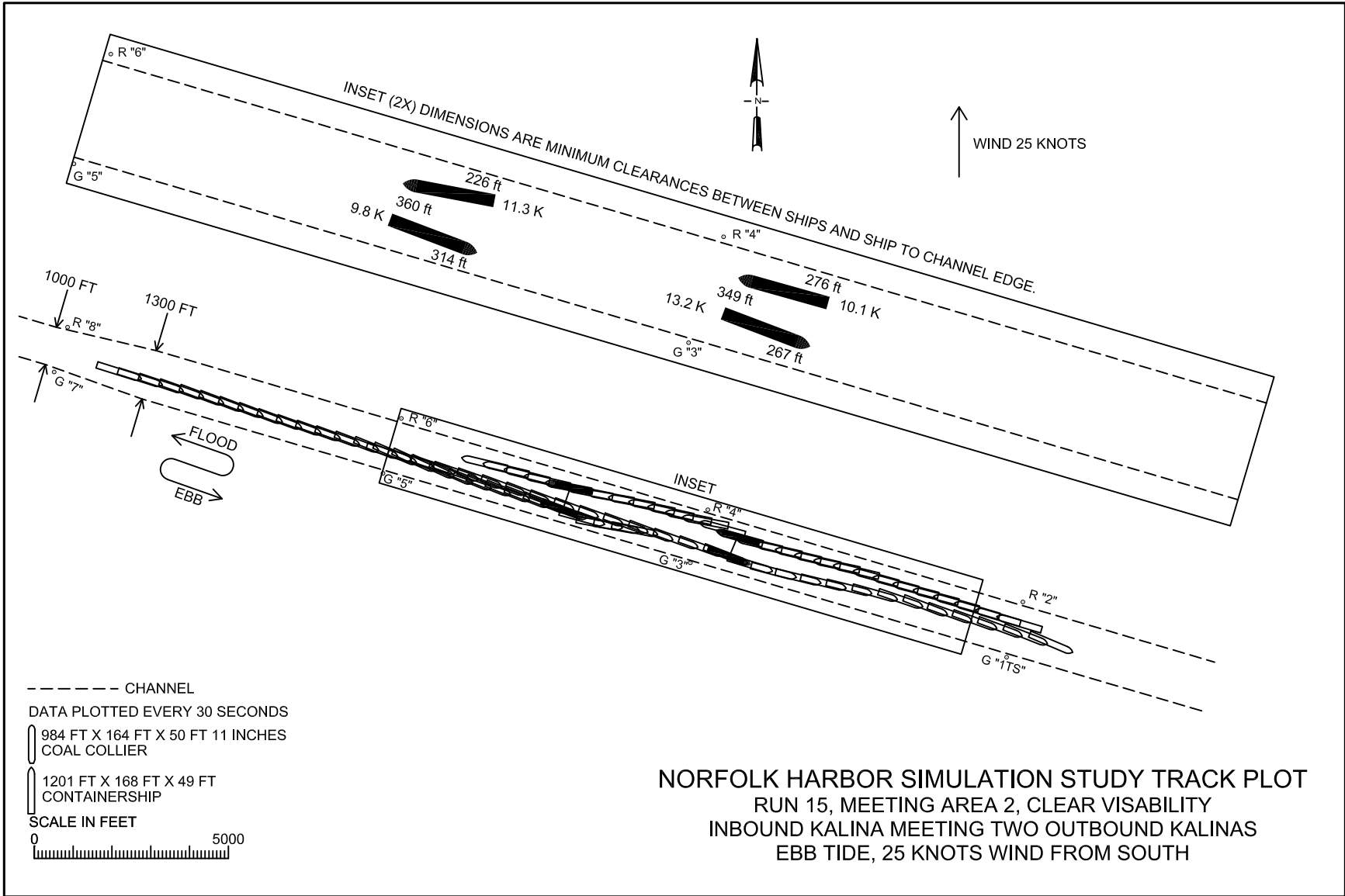
SCALE IN FEET  
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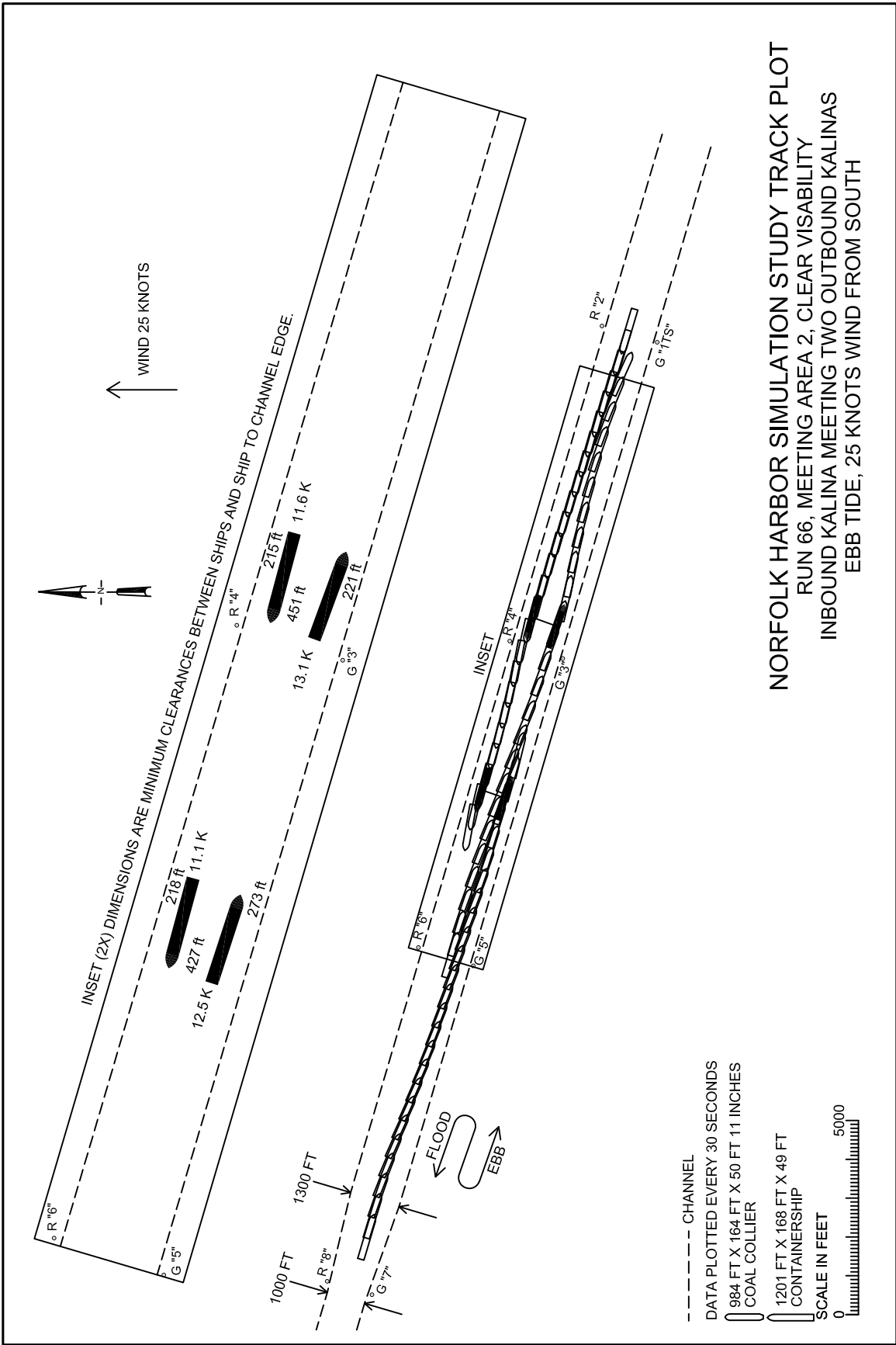


**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 COMPOSITE OF RUNS 21, 88, AND 124  
 OUTBOUND, BULK CARRIER, FLOOD TIDE  
 25 KNOTS WIND FROM NORTH

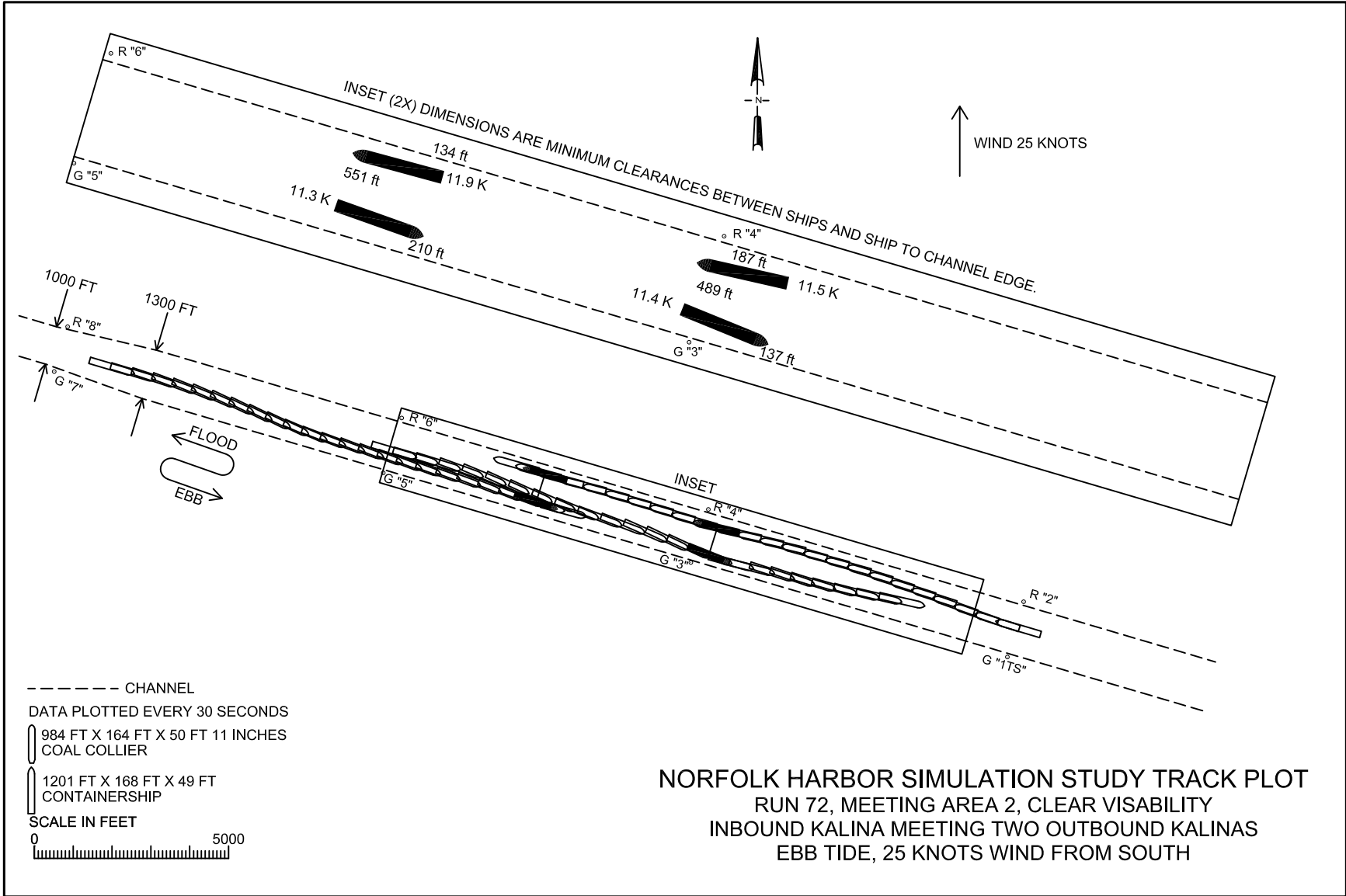


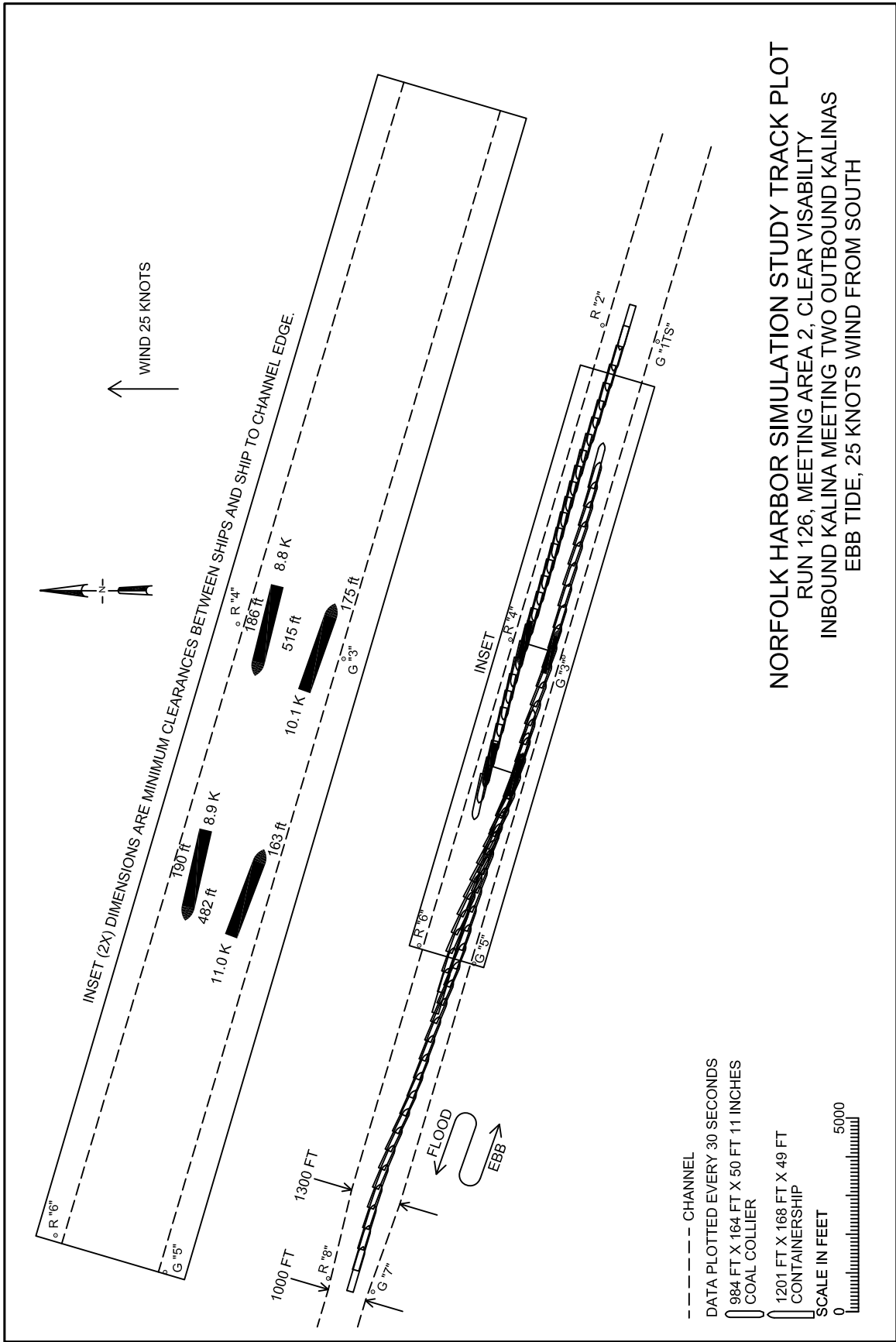
**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 7, MEETING AREA 2, CLEAR VISIBILITY  
 INBOUND KALINA MEETING TWO OUTBOUND KALINAS  
 EBB TIDE, 25 KNOTS WIND FROM SOUTH





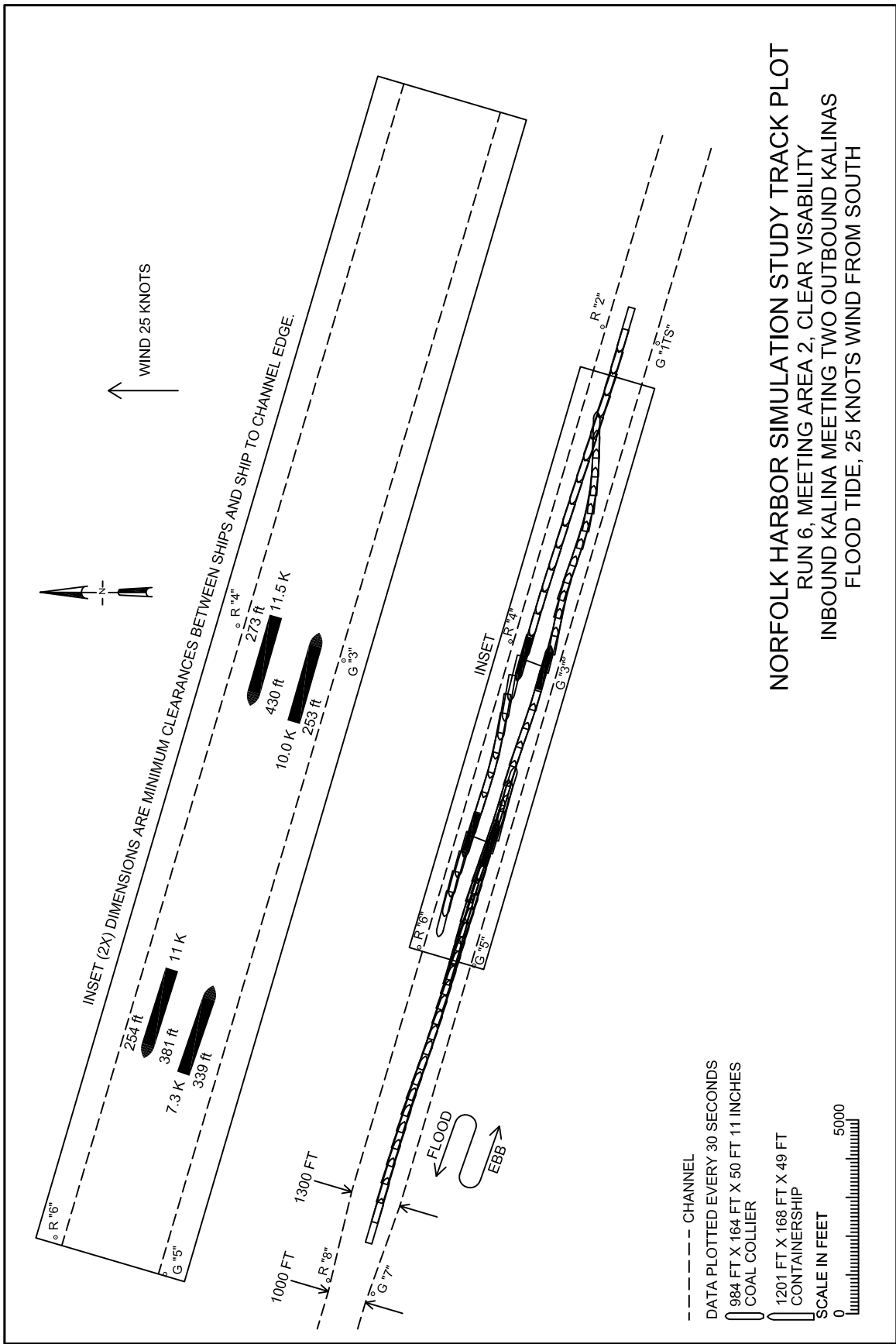
**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 66, MEETING AREA 2, CLEAR VISIBILITY  
 INBOUND KALINA MEETING TWO OUTBOUND KALINAS  
 EBB TIDE, 25 KNOTS WIND FROM SOUTH



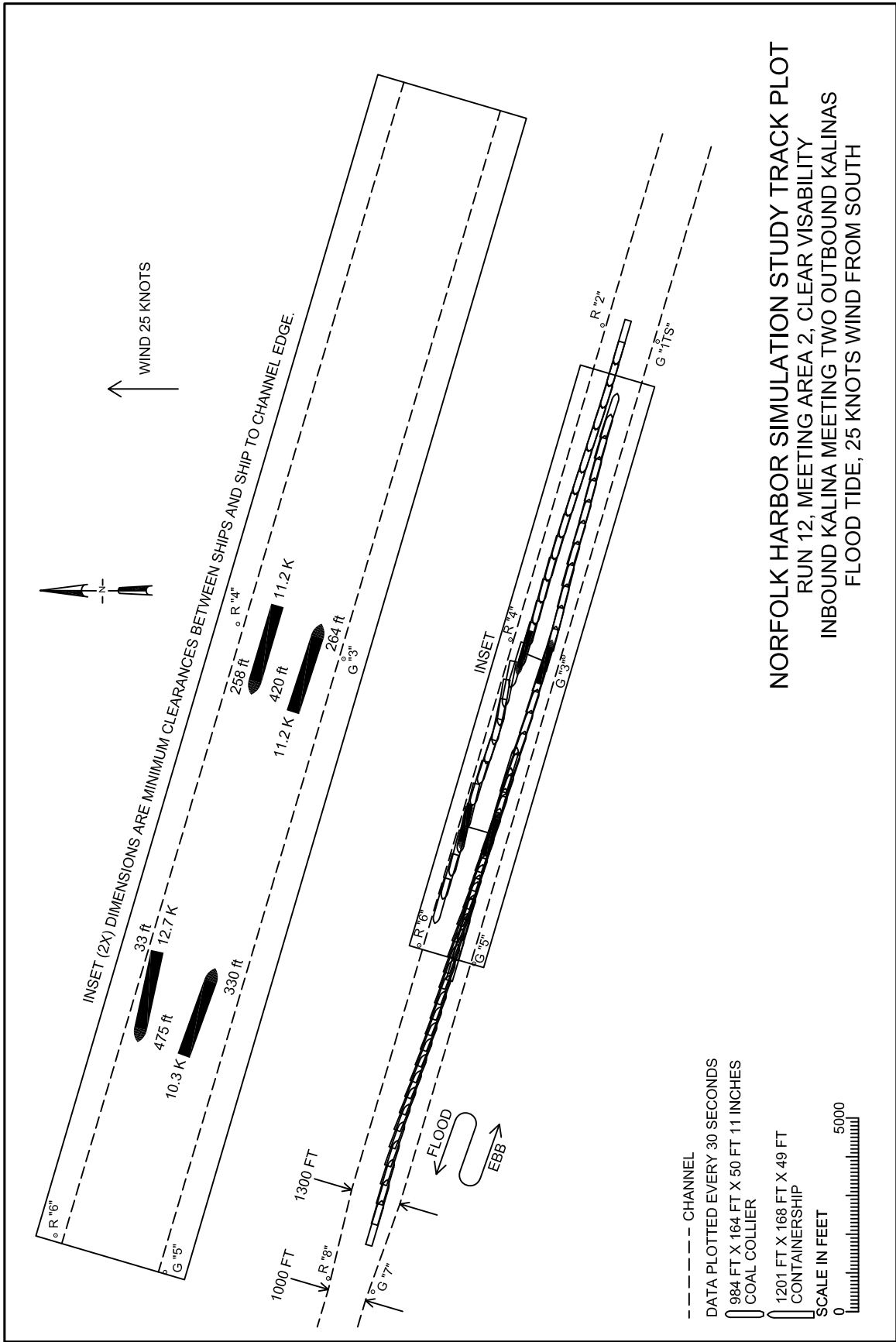


NORFOLK HARBOR SIMULATION STUDY TRACK PLOT  
 RUN 126, MEETING AREA 2, CLEAR VISIBILITY  
 INBOUND KALINA MEETING TWO OUTBOUND KALINAS  
 EBB TIDE, 25 KNOTS WIND FROM SOUTH





**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 6, MEETING AREA 2, CLEAR VISIBILITY  
 INBOUND KALINA MEETING TWO OUTBOUND KALINAS  
 FLOOD TIDE; 25 KNOTS WIND FROM SOUTH



**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 12, MEETING AREA 2, CLEAR VISIBILITY  
 INBOUND KALINA MEETING TWO OUTBOUND KALINAS  
 FLOOD TIDE, 25 KNOTS WIND FROM SOUTH

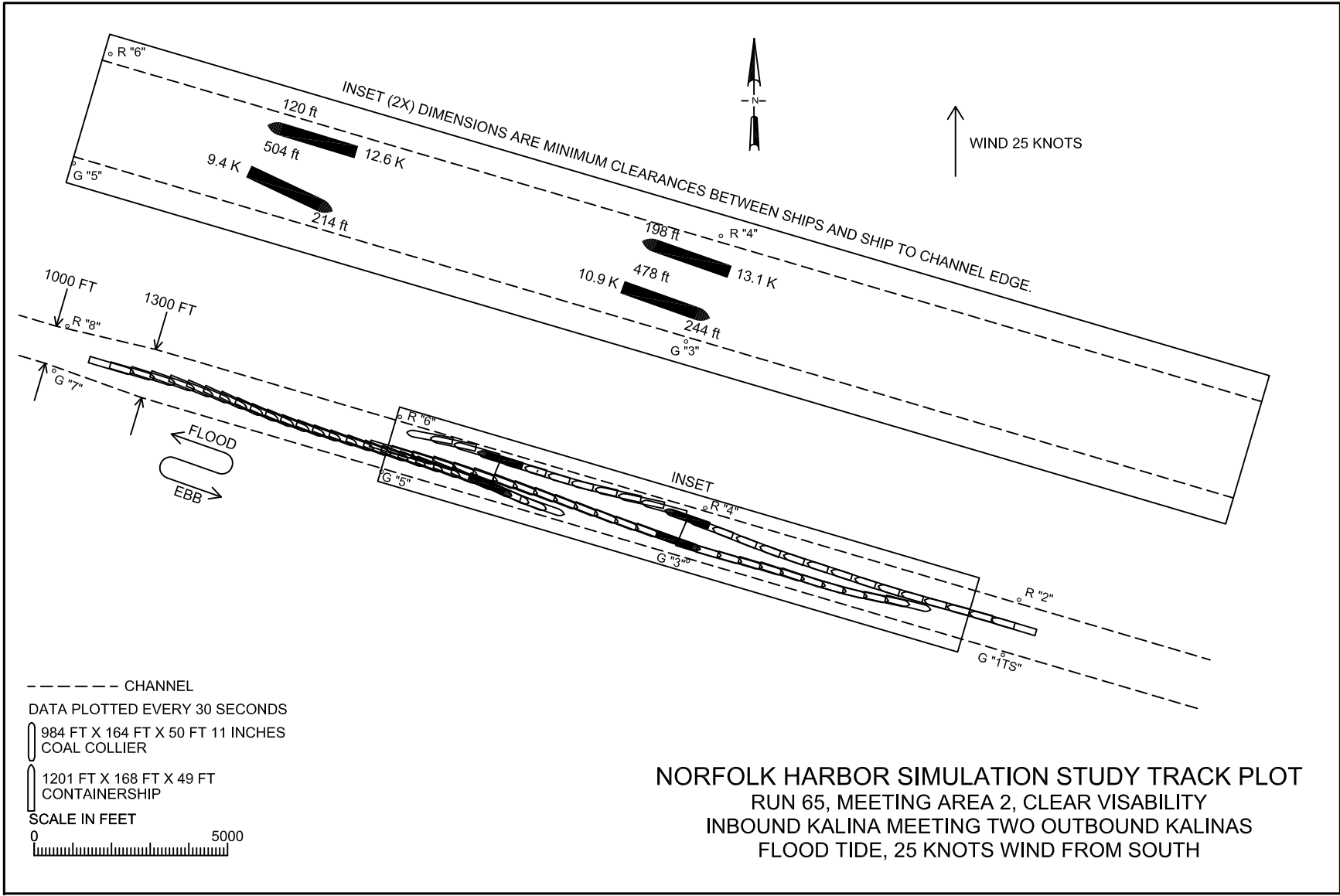
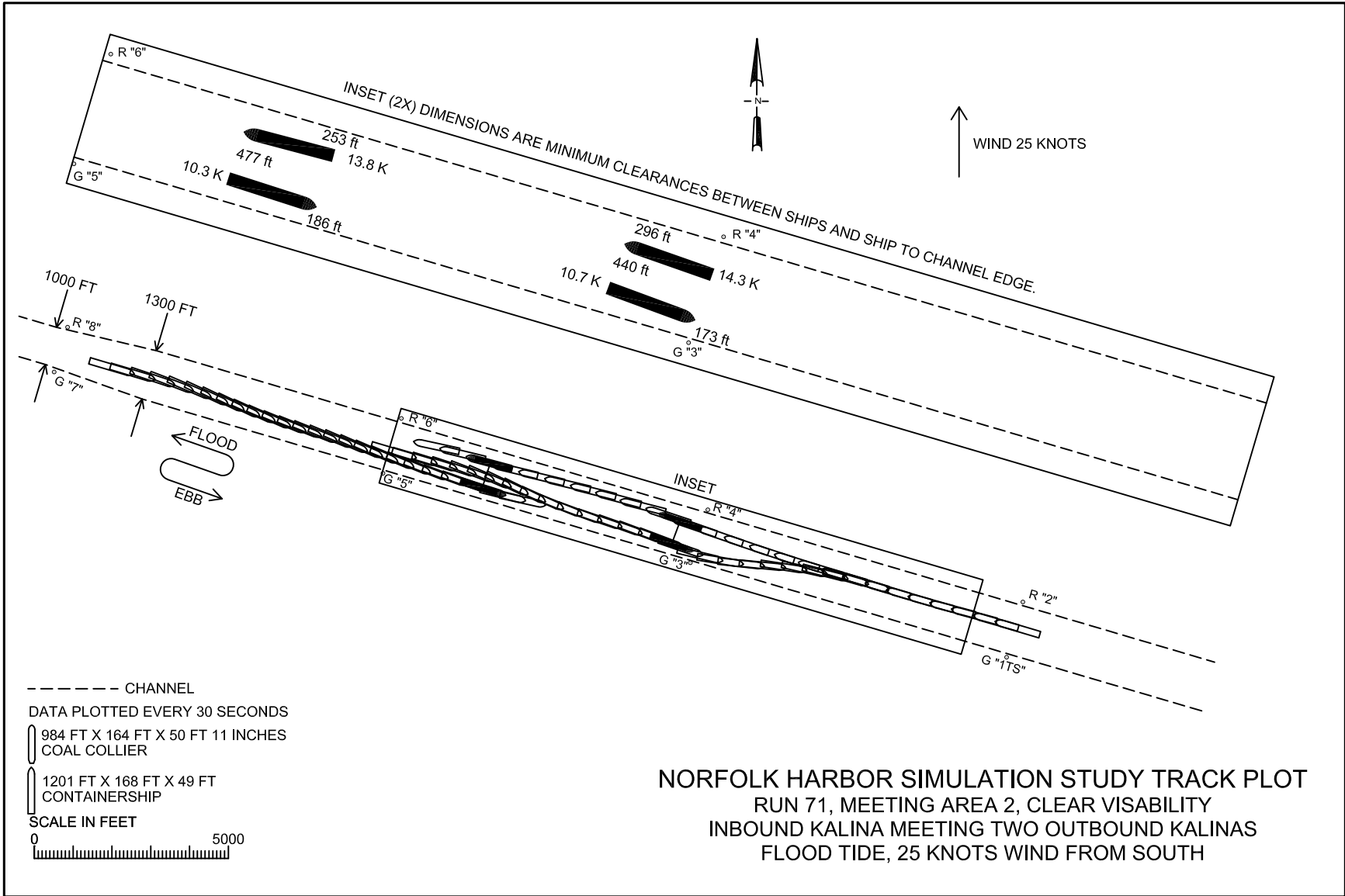


PLATE 36



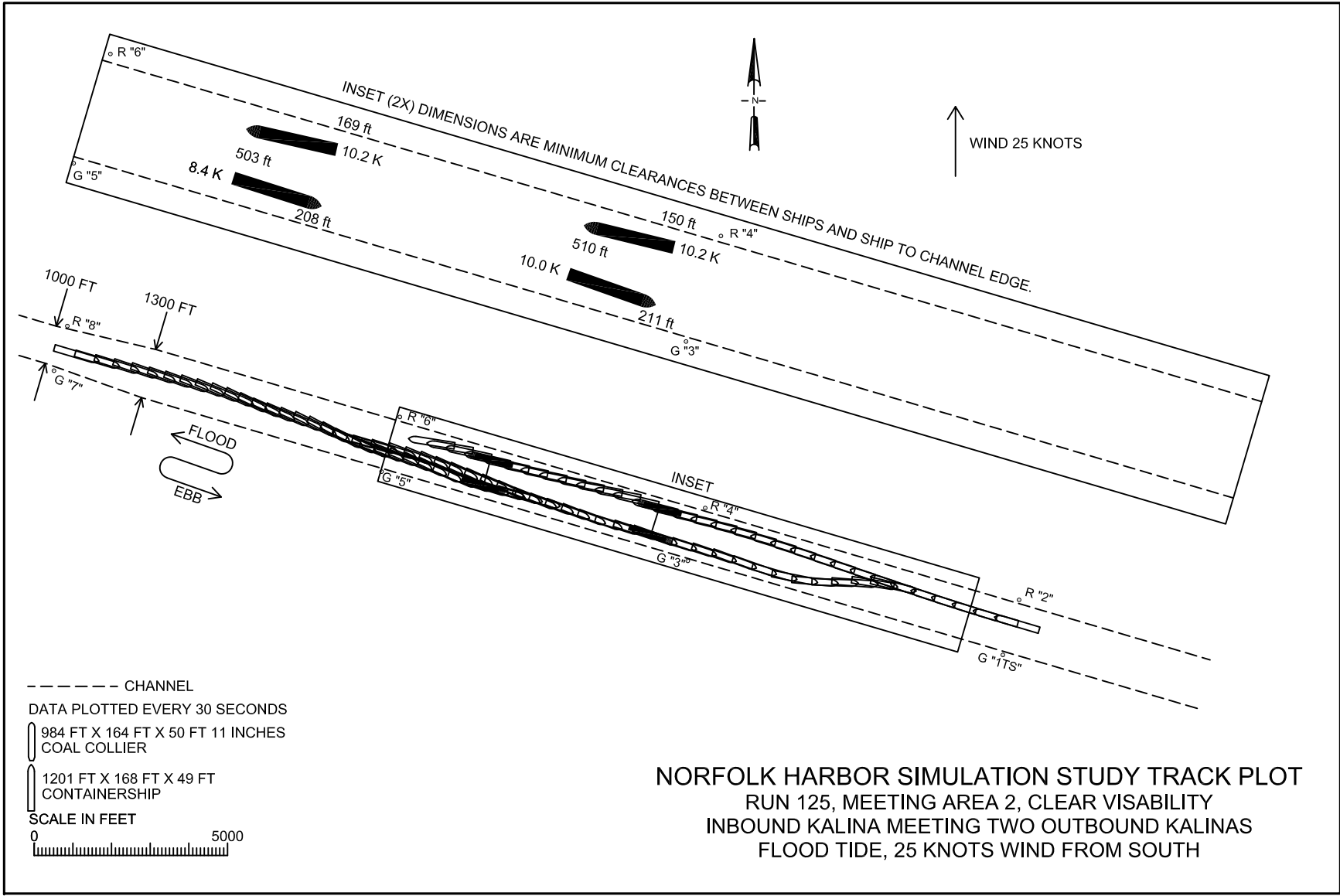
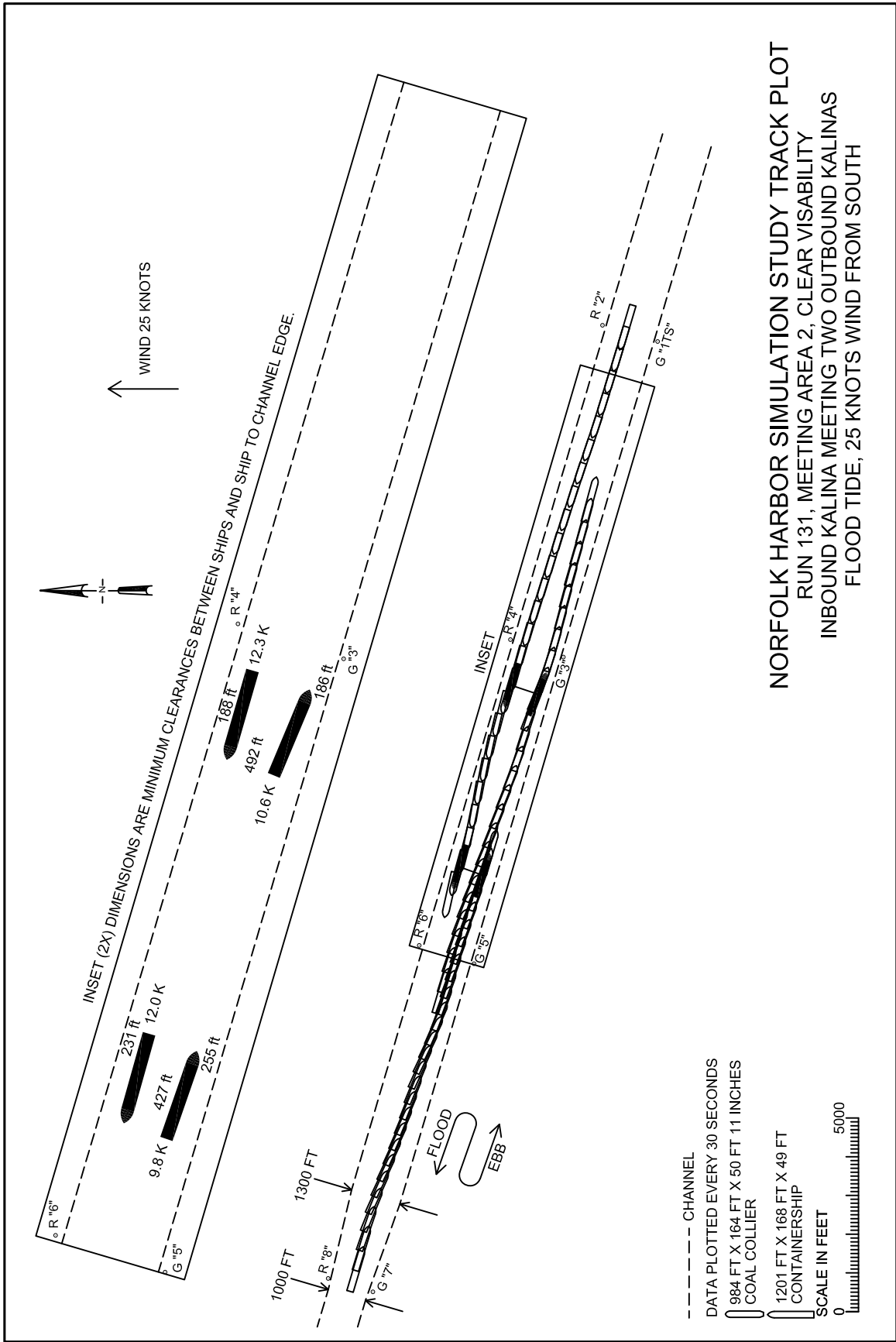


PLATE 38



NORFOLK HARBOR SIMULATION STUDY TRACK PLOT  
 RUN 131, MEETING AREA 2, CLEAR VISIBILITY  
 INBOUND KALINA MEETING TWO OUTBOUND KALINAS  
 FLOOD TIDE, 25 KNOTS WIND FROM SOUTH

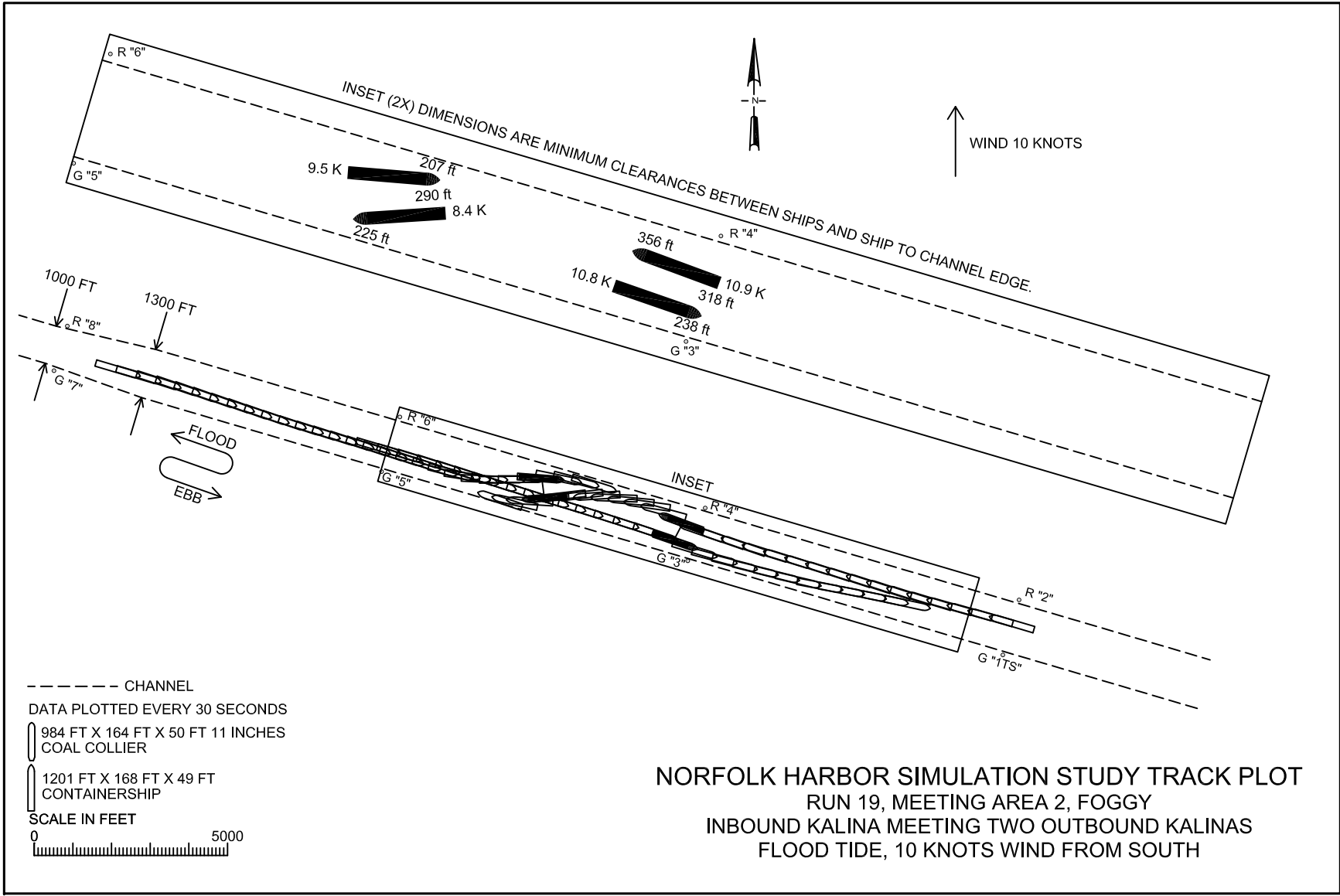
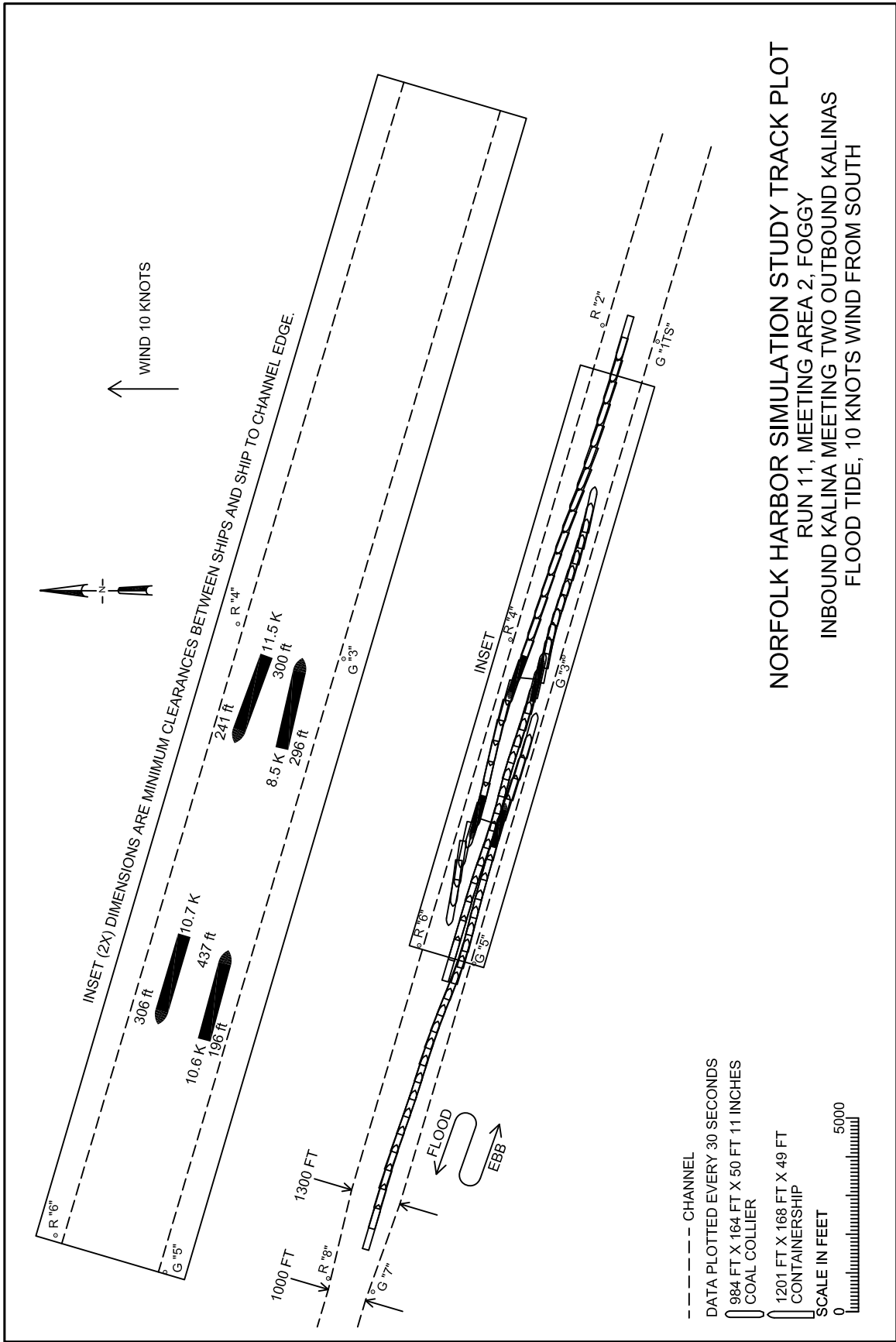
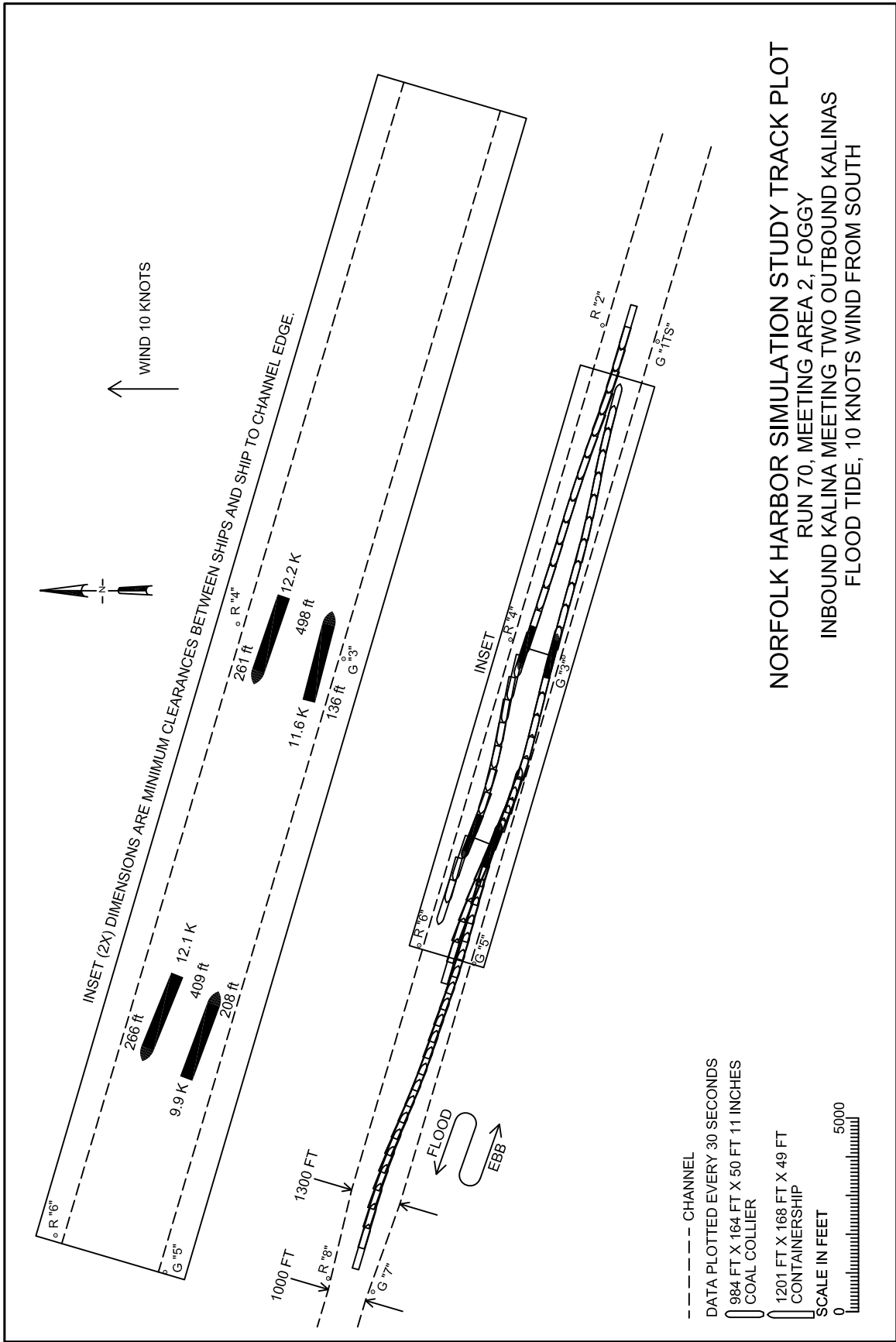


PLATE 40

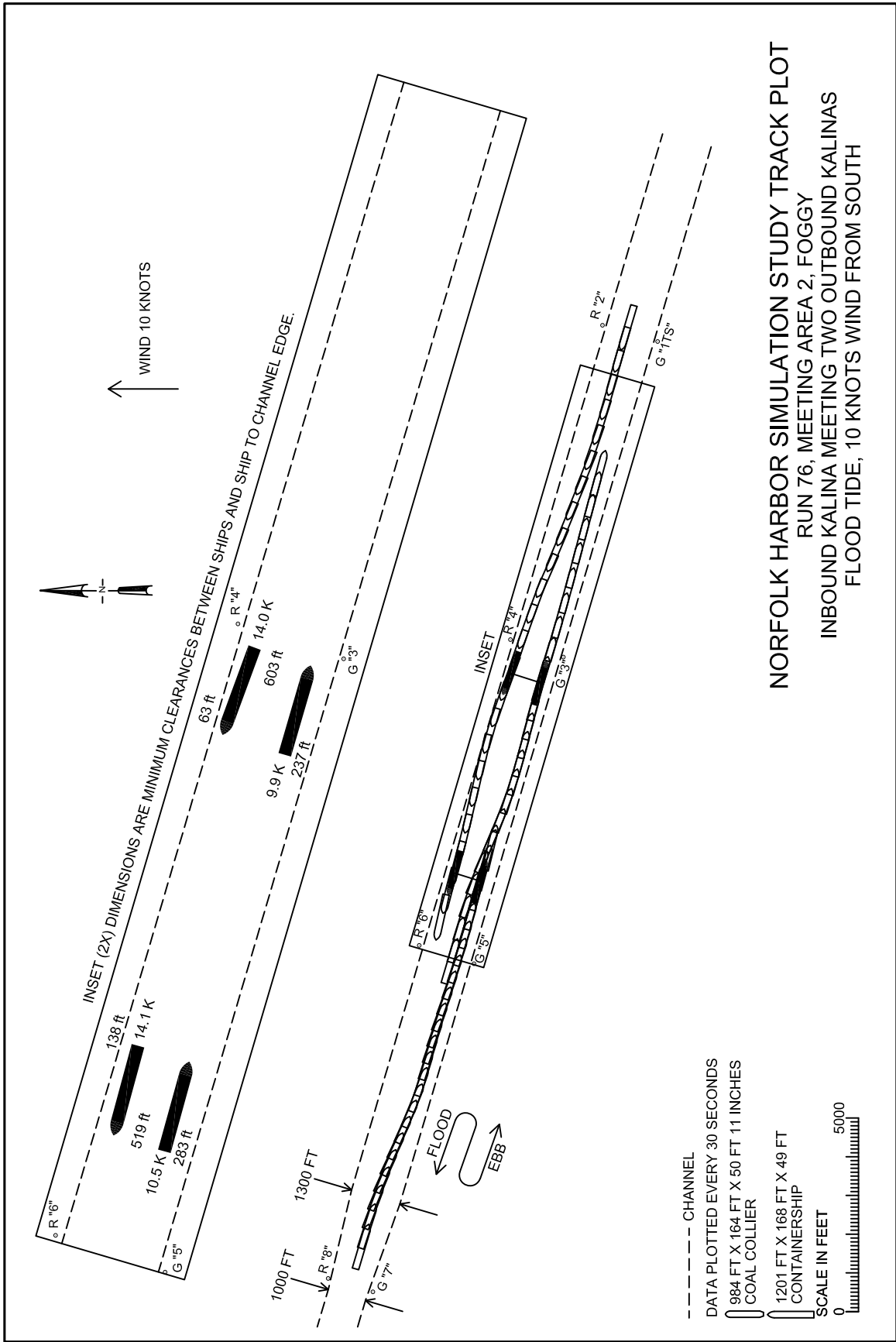


**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 11, MEETING AREA 2, FOGGY  
 INBOUND KALINA MEETING TWO OUTBOUND KALINAS  
 FLOOD TIDE, 10 KNOTS WIND FROM SOUTH

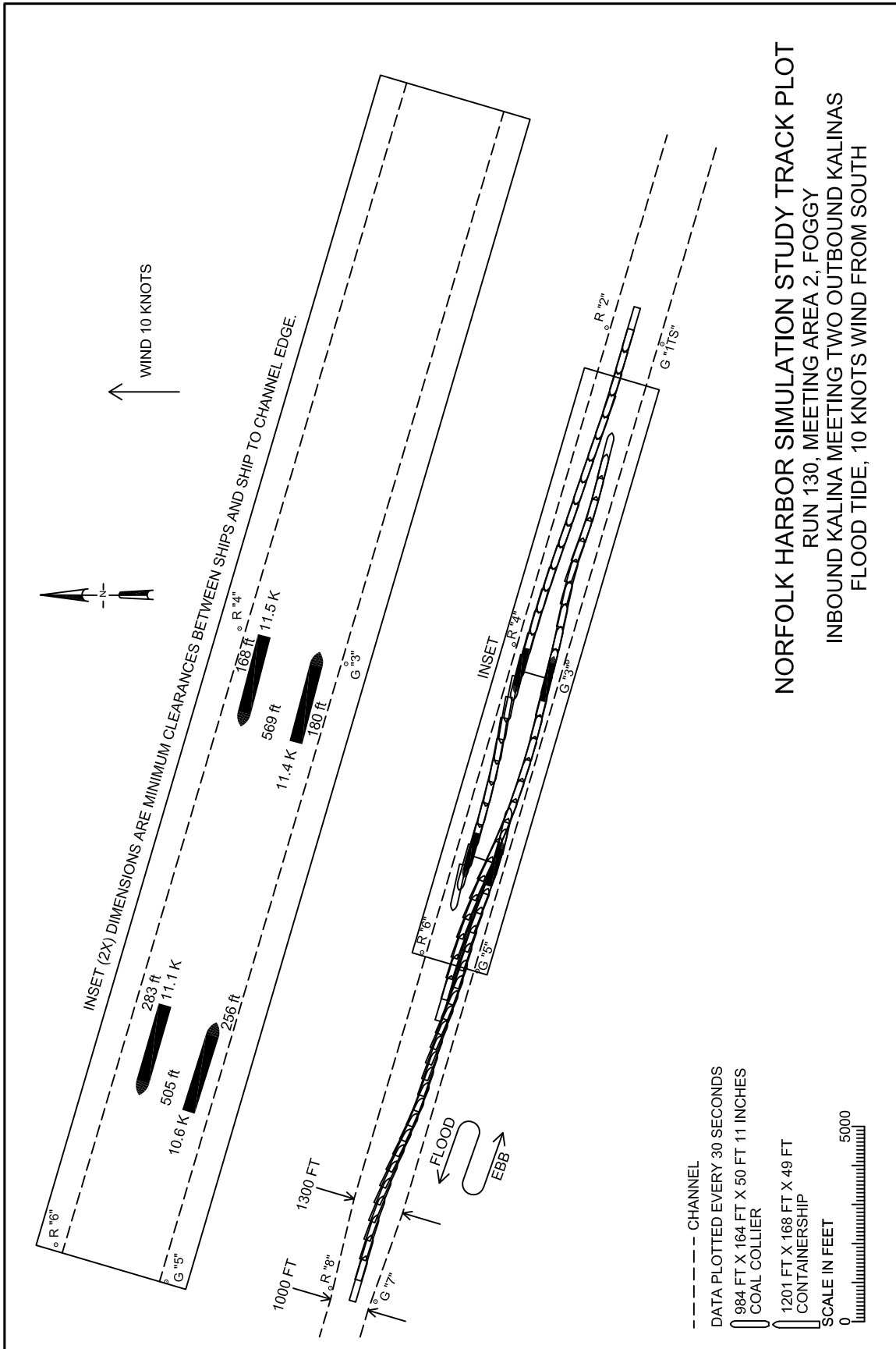


**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 70, MEETING AREA 2, FOGGY  
 INBOUND KALINA MEETING TWO OUTBOUND KALINAS  
 FLOOD TIDE, 10 KNOTS WIND FROM SOUTH

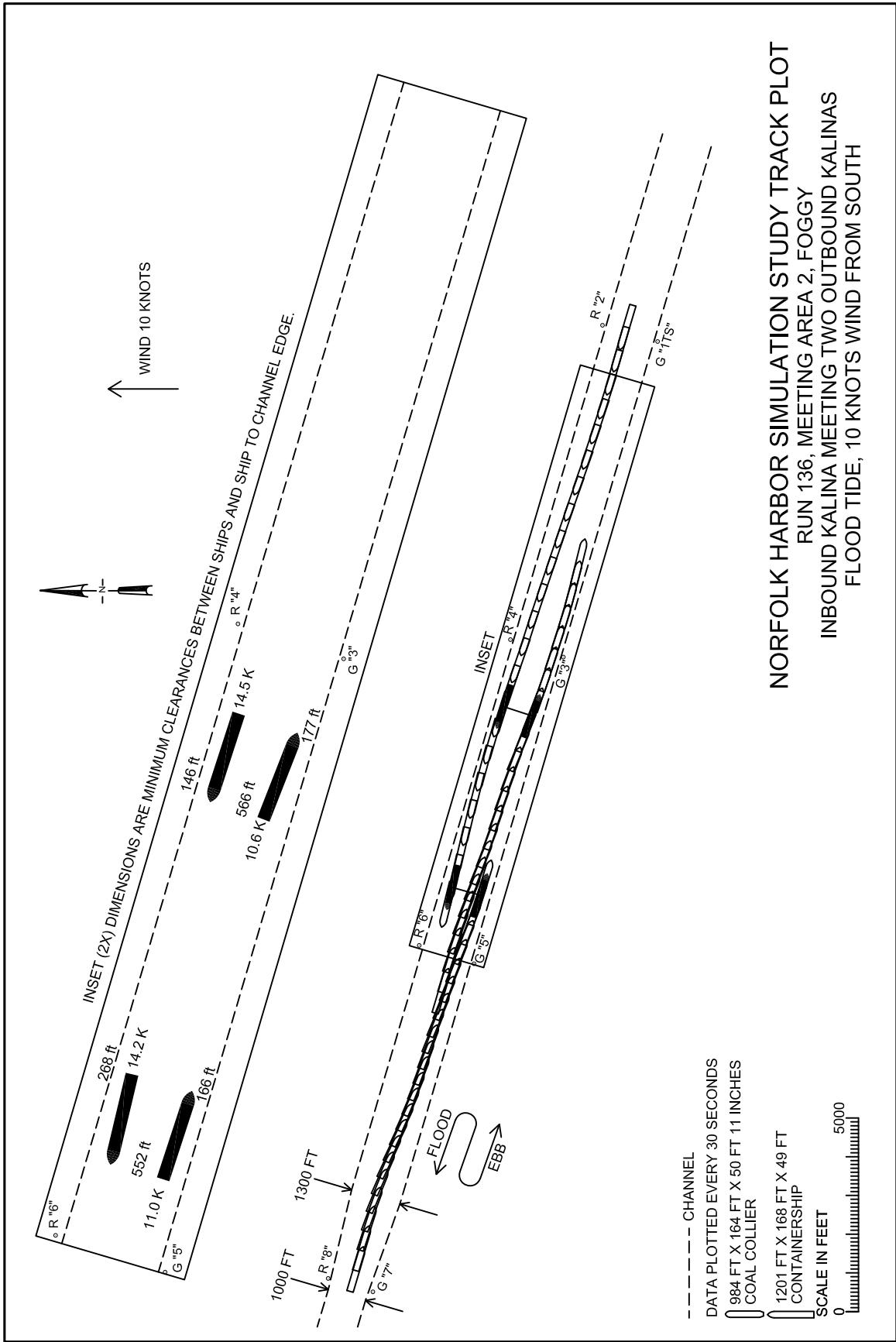
--- CHANNEL  
 DATA PLOTTED EVERY 30 SECONDS  
 984 FT X 164 FT X 50 FT 11 INCHES  
 COAL COLLIER  
 1201 FT X 168 FT X 49 FT  
 CONTAINERSHIP  
 SCALE IN FEET  
 0 5000

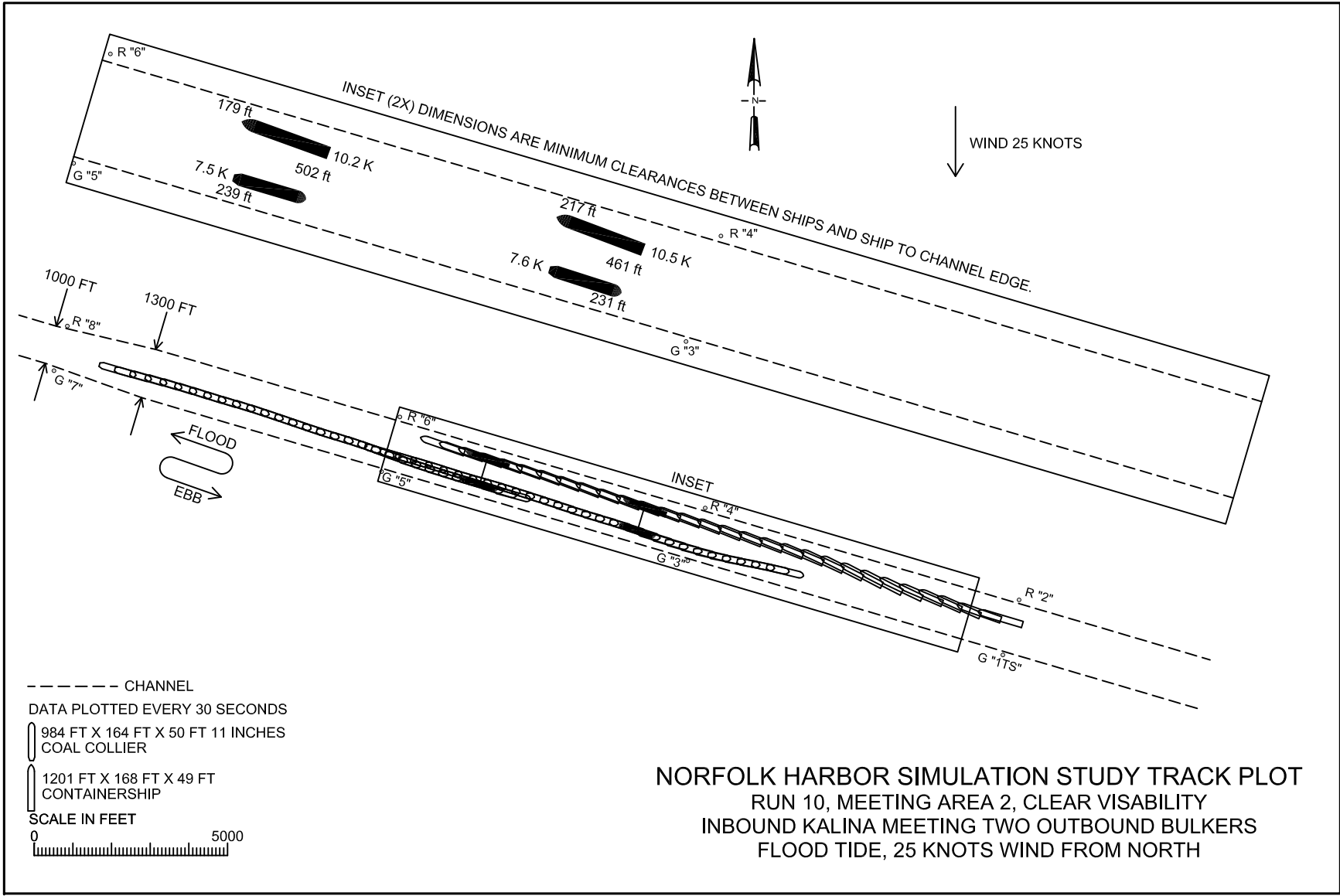


**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 76, MEETING AREA 2, FOGGY  
 INBOUND KALINA MEETING TWO OUTBOUND KALINAS  
 FLOOD TIDE, 10 KNOTS WIND FROM SOUTH

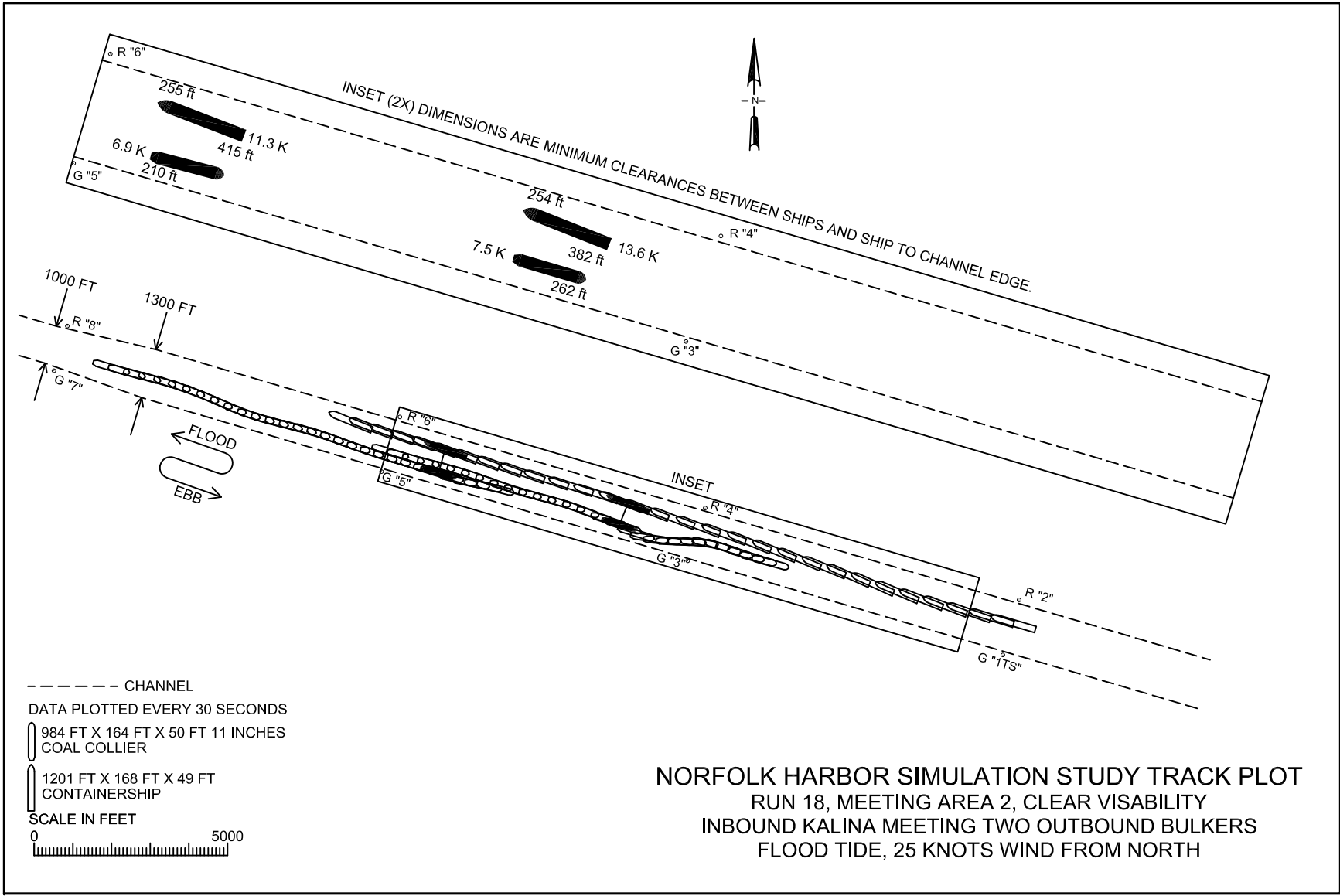


**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 130, MEETING AREA 2, FOGGY  
 INBOUND KALINA MEETING TWO OUTBOUND KALINAS  
 FLOOD TIDE; 10 KNOTS WIND FROM SOUTH





NORFOLK HARBOR SIMULATION STUDY TRACK PLOT  
 RUN 10, MEETING AREA 2, CLEAR VISIBILITY  
 INBOUND KALINA MEETING TWO OUTBOUND BULKERS  
 FLOOD TIDE, 25 KNOTS WIND FROM NORTH



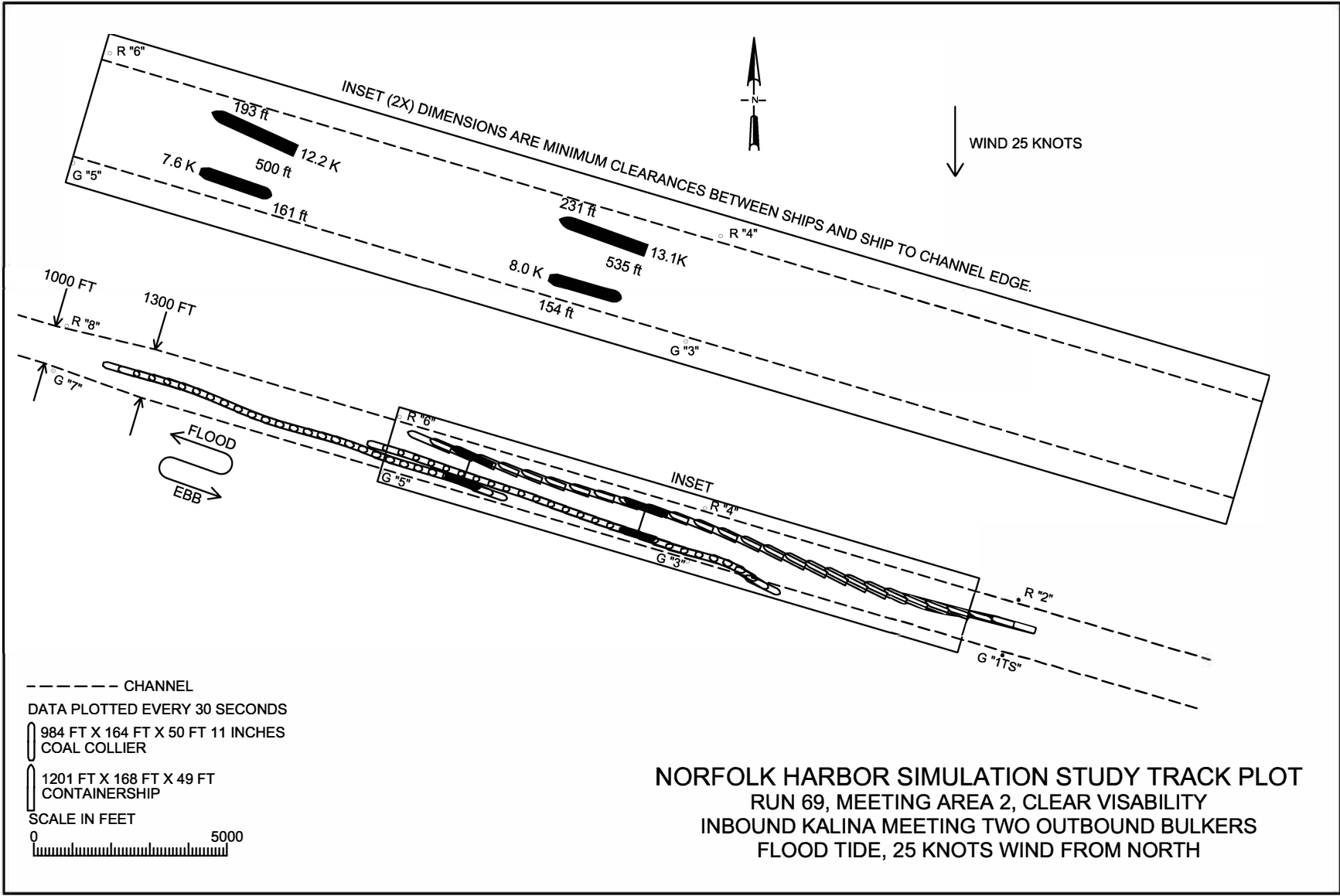
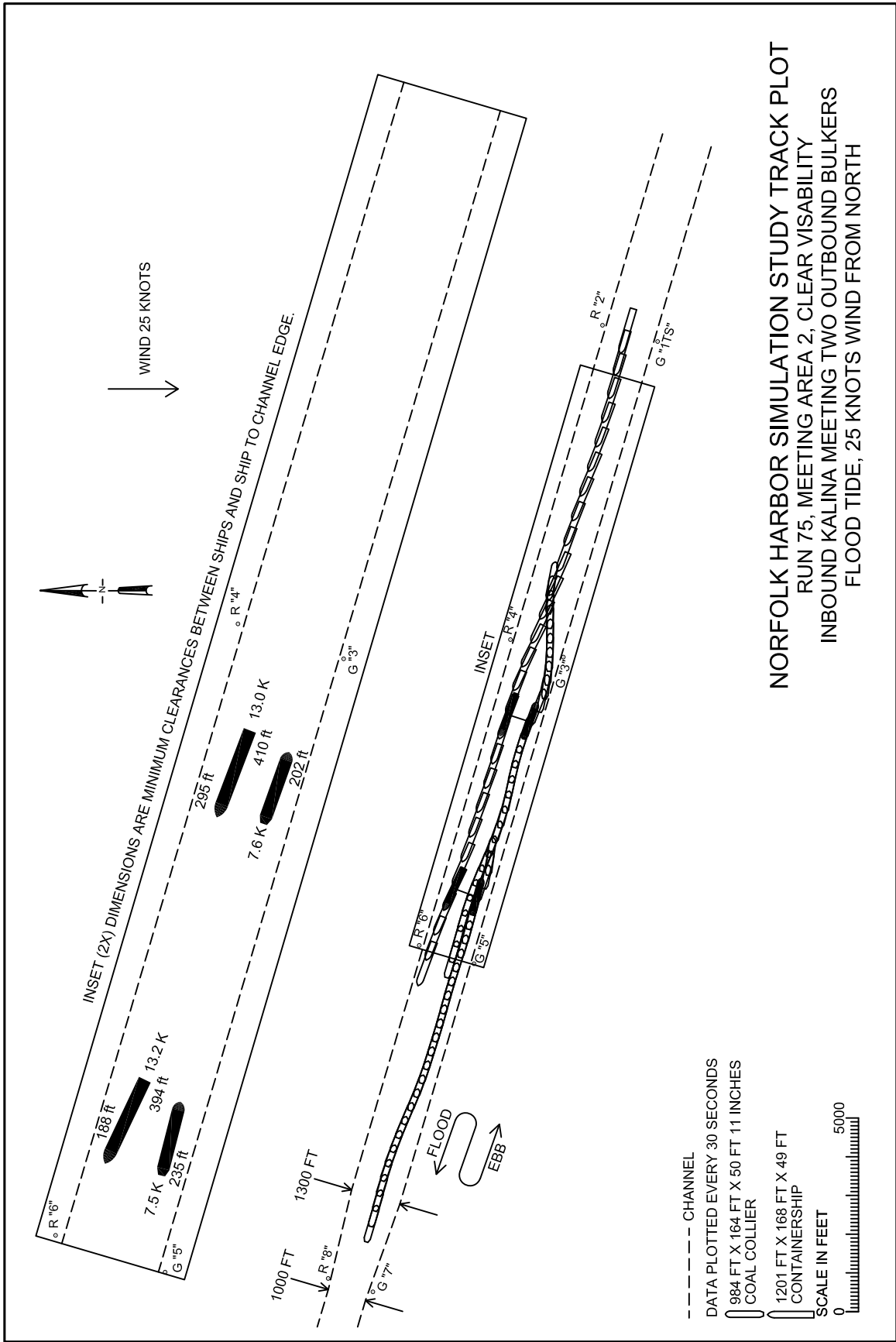
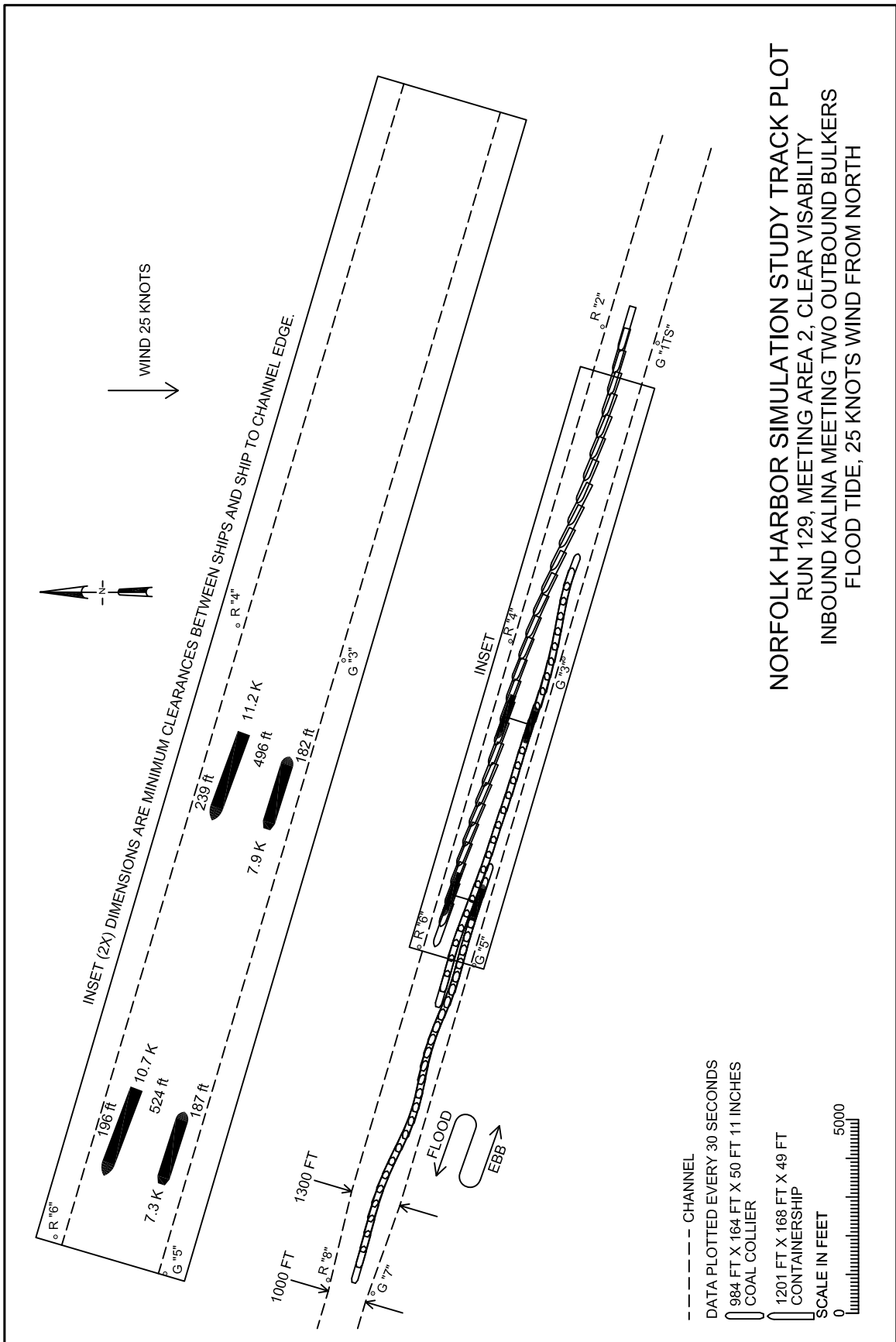


PLATE 48

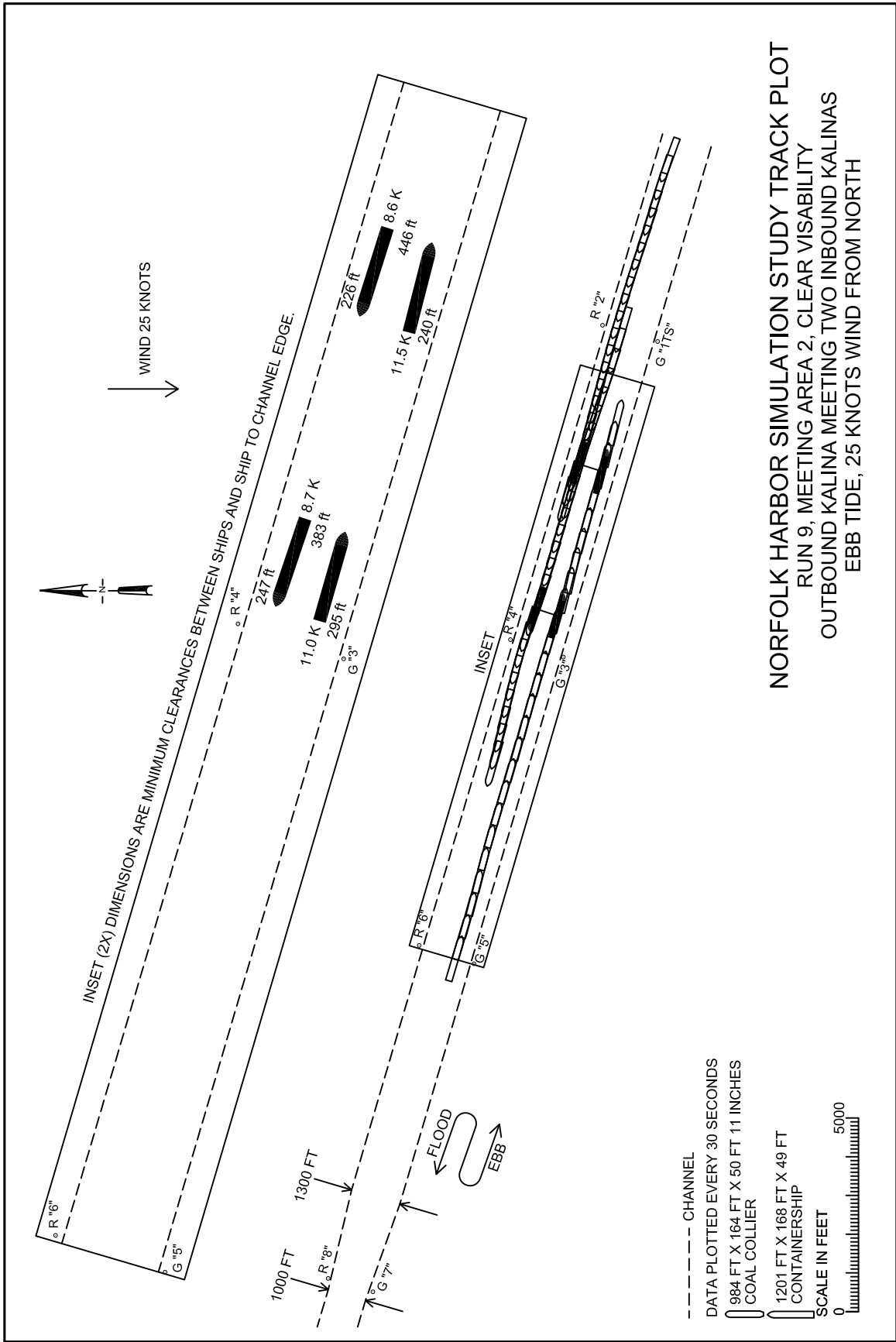


**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 75, MEETING AREA 2, CLEAR VISIBILITY  
 INBOUND KALINA MEETING TWO OUTBOUND BULKERS  
 FLOOD TIDE, 25 KNOTS WIND FROM NORTH



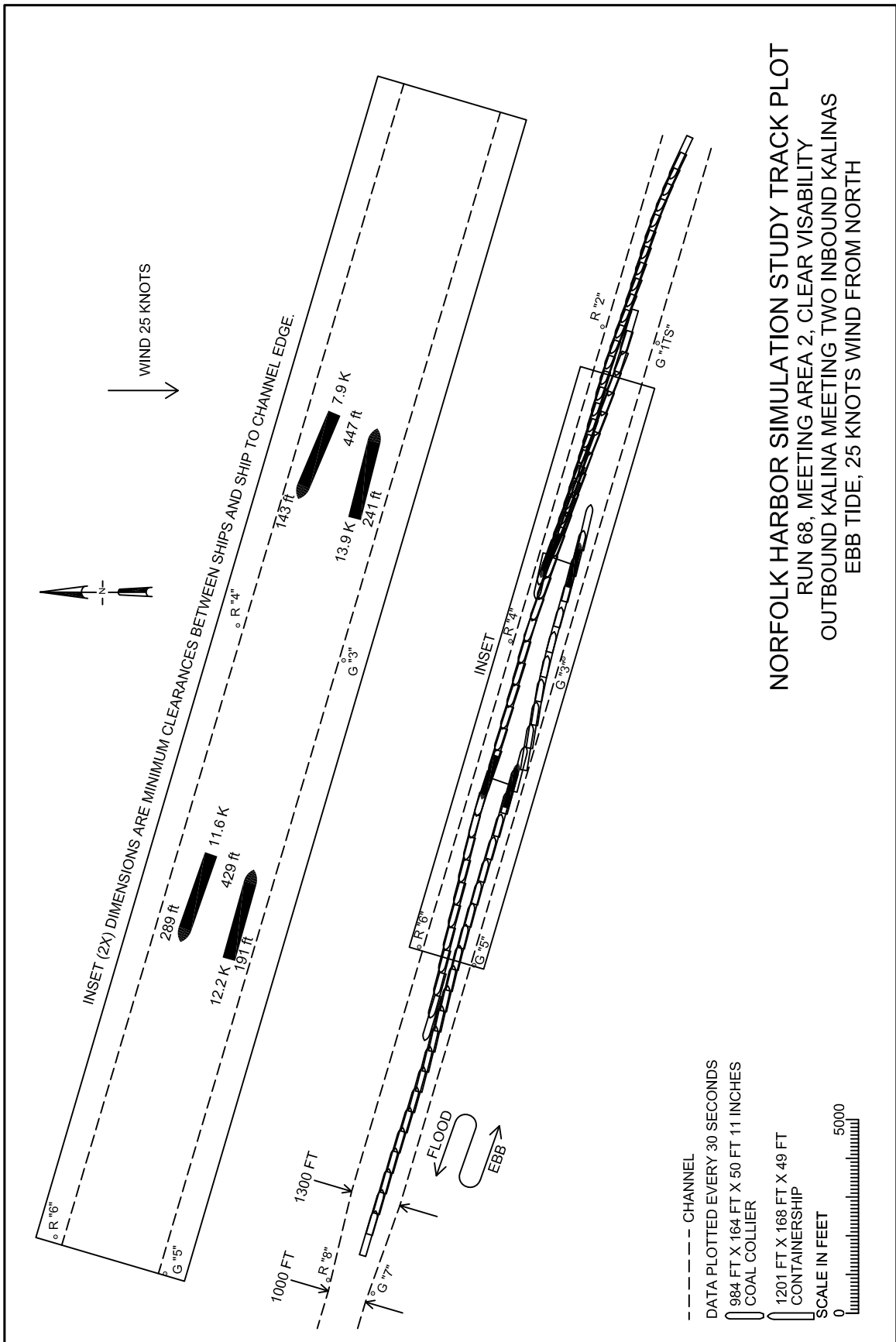
**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 129, MEETING AREA 2, CLEAR VISIBILITY  
 INBOUND KALINA MEETING TWO OUTBOUND BULKERS  
 FLOOD TIDE, 25 KNOTS WIND FROM NORTH

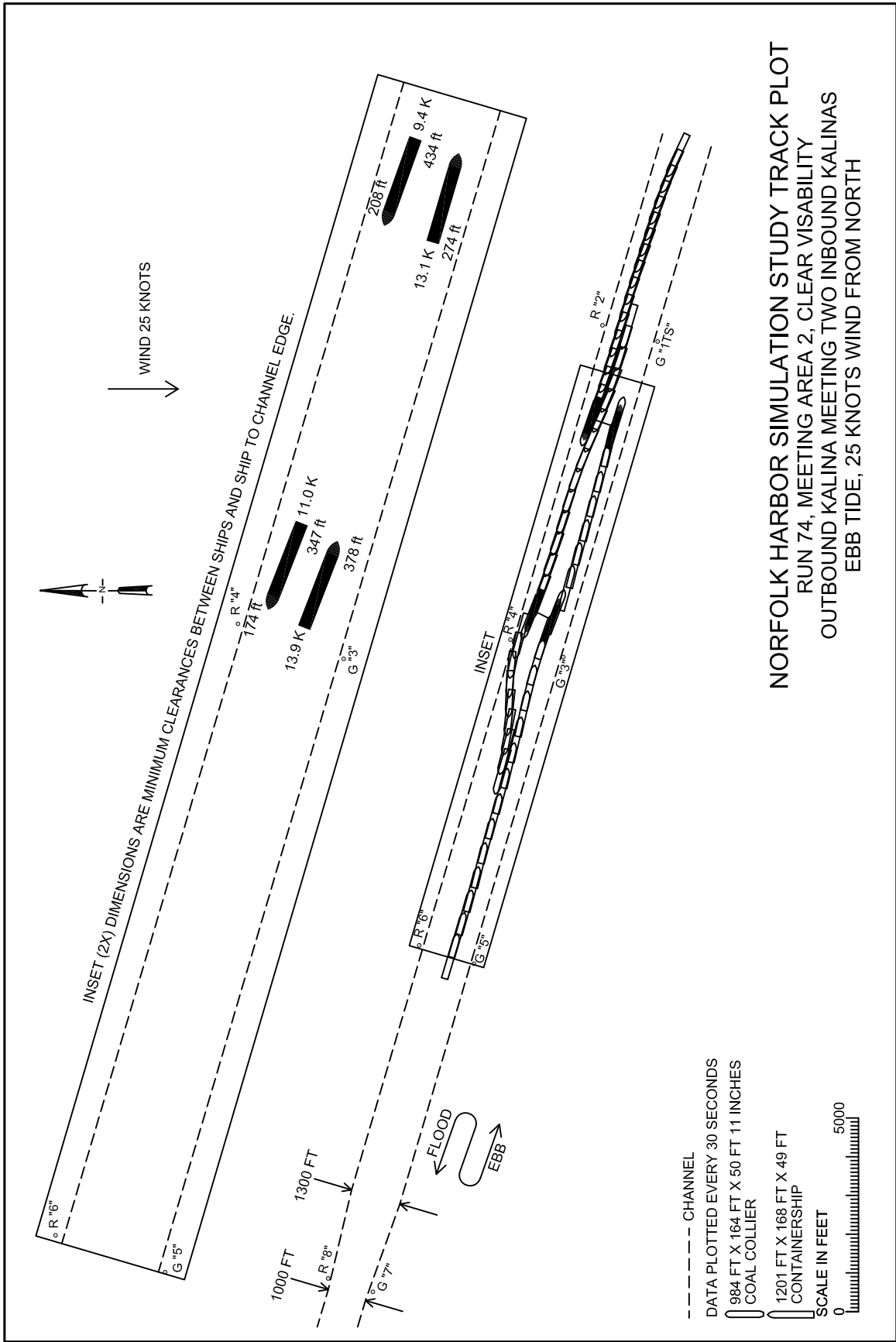




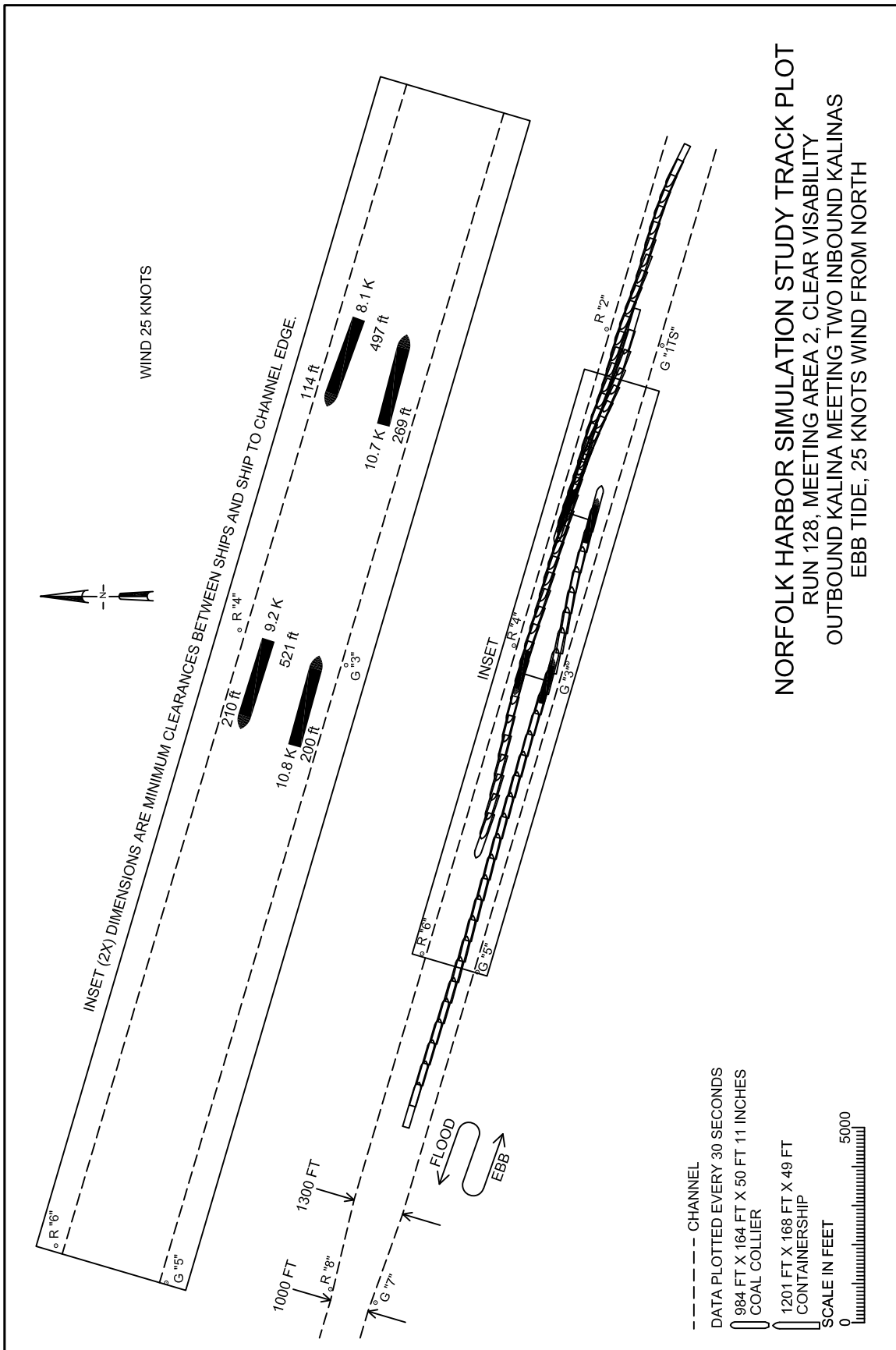
**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 9, MEETING AREA 2, CLEAR VISIBILITY  
 OUTBOUND KALINA MEETING TWO INBOUND KALINAS  
 EBB TIDE, 25 KNOTS WIND FROM NORTH



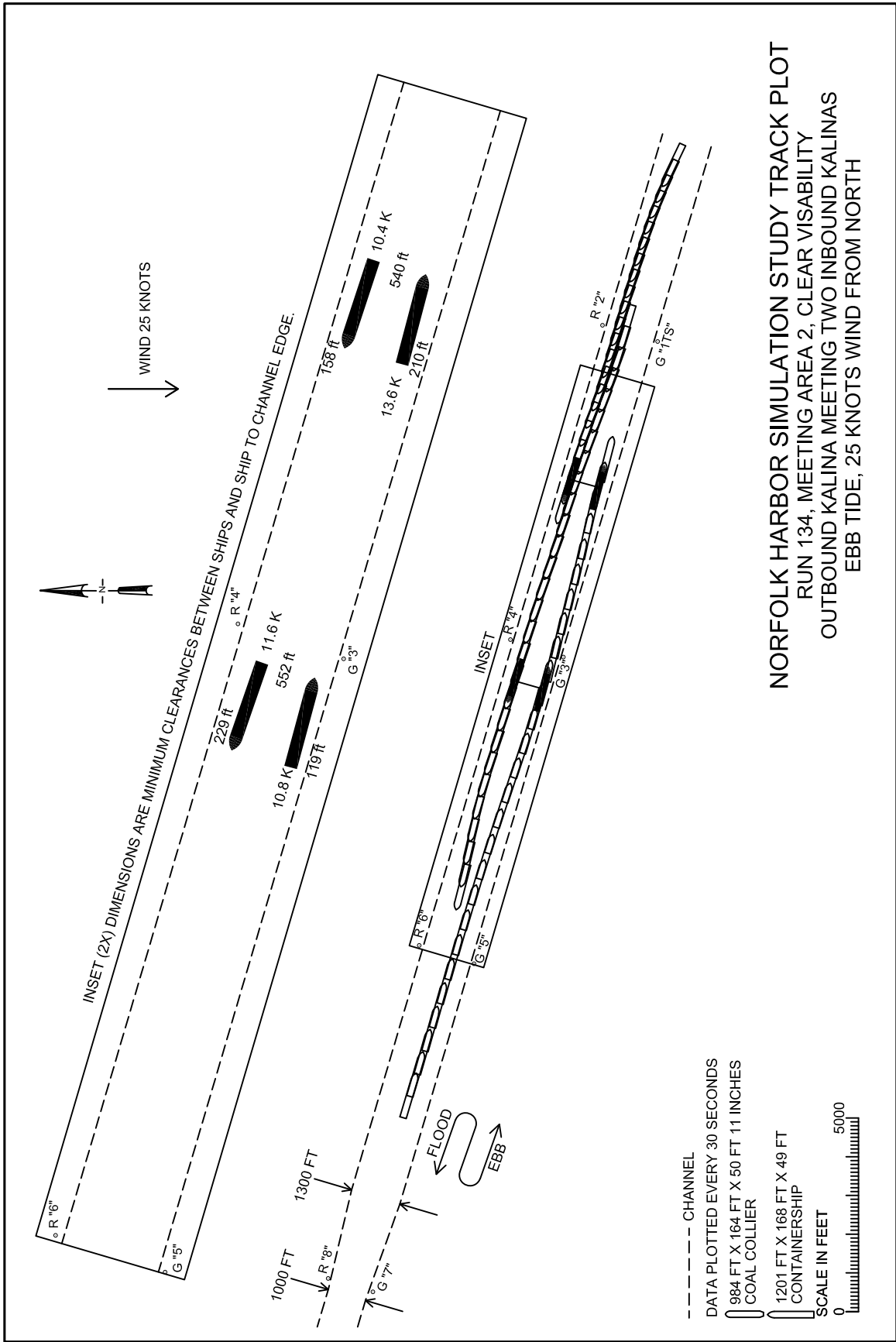


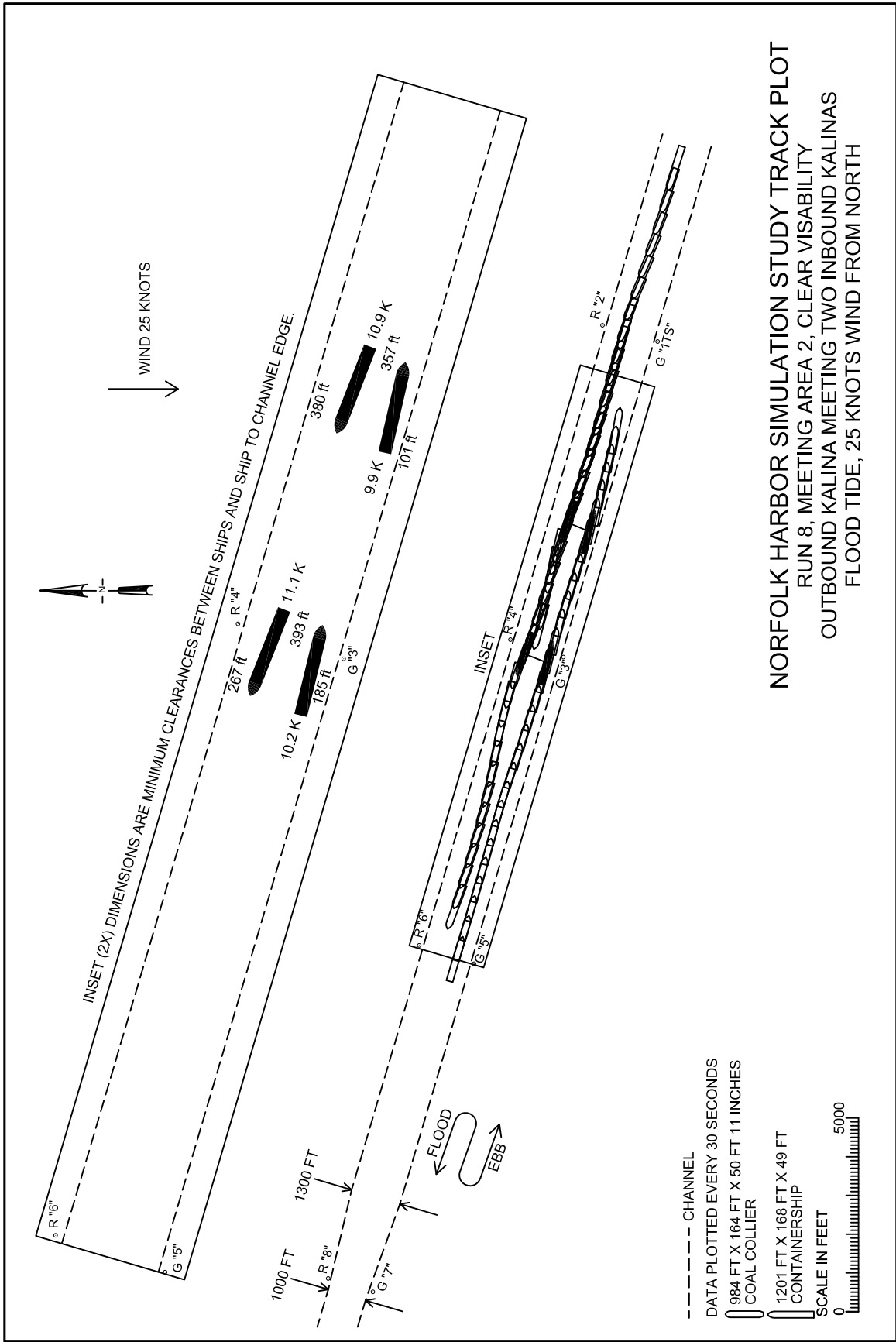


**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 74, MEETING AREA 2, CLEAR VISIBILITY  
 OUTBOUND KALINA MEETING TWO INBOUND KALINAS  
 EBB TIDE, 25 KNOTS WIND FROM NORTH

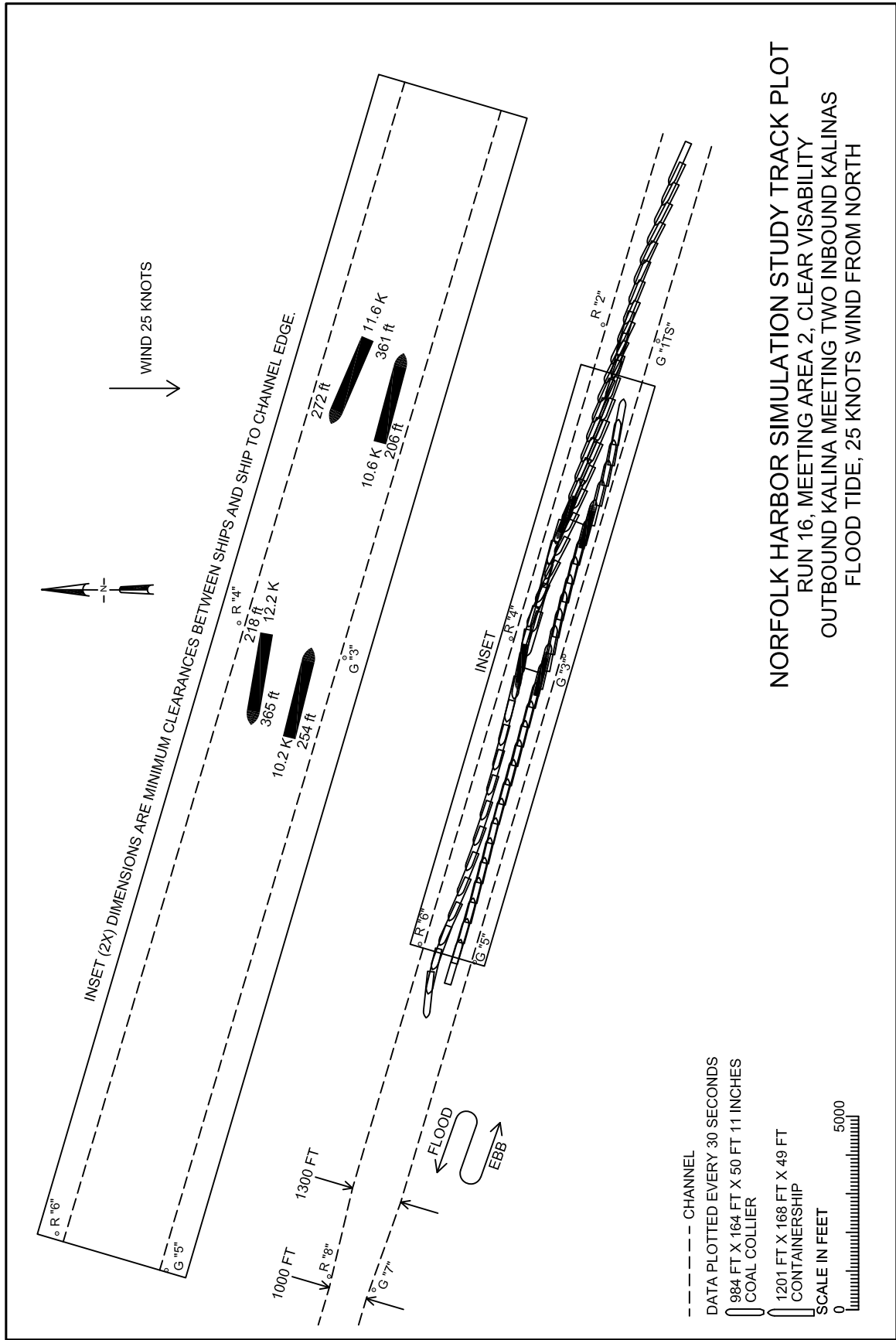


**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 128, MEETING AREA 2, CLEAR VISIBILITY  
 OUTBOUND KALINA MEETING TWO INBOUND KALINAS  
 EBB TIDE, 25 KNOTS WIND FROM NORTH

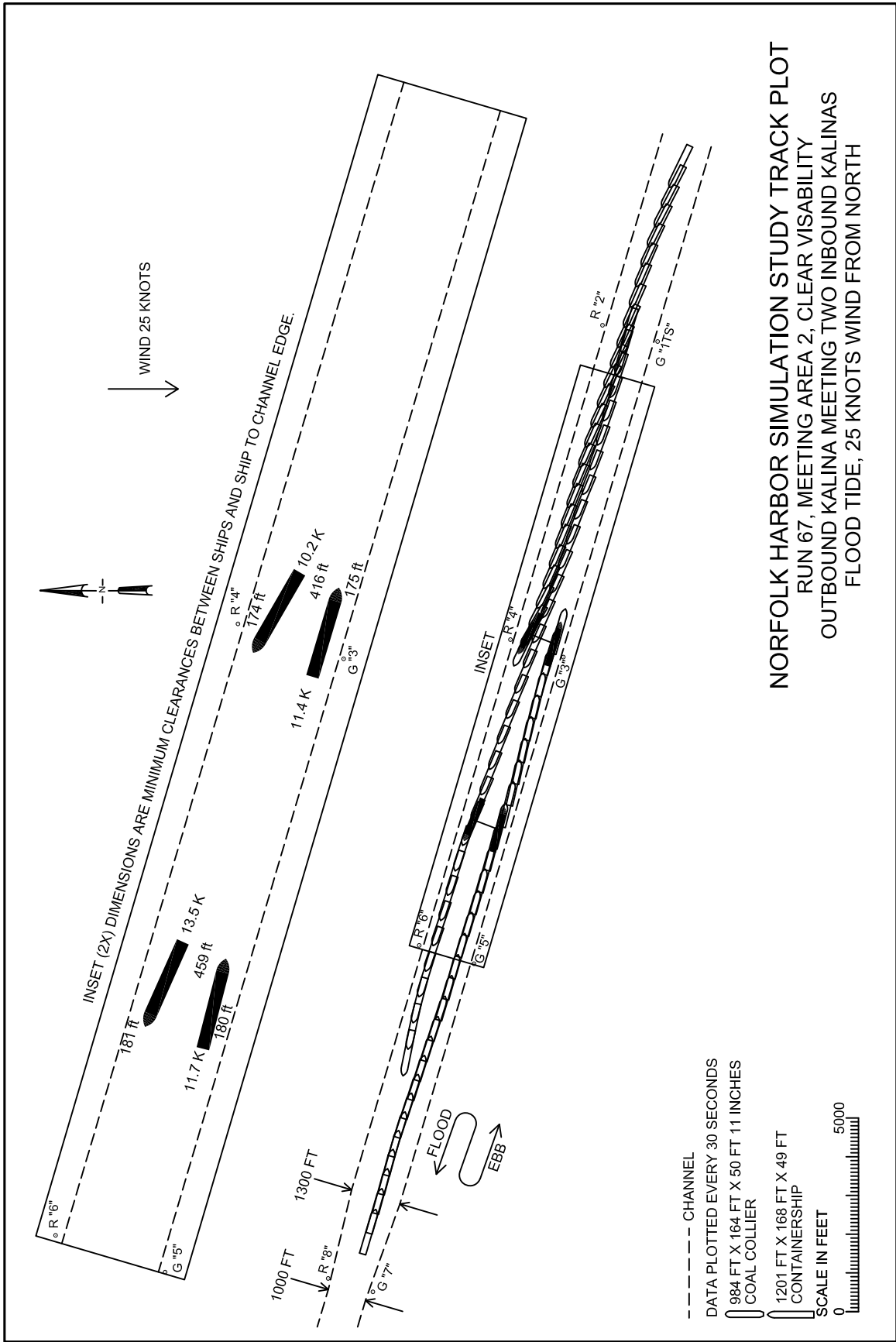




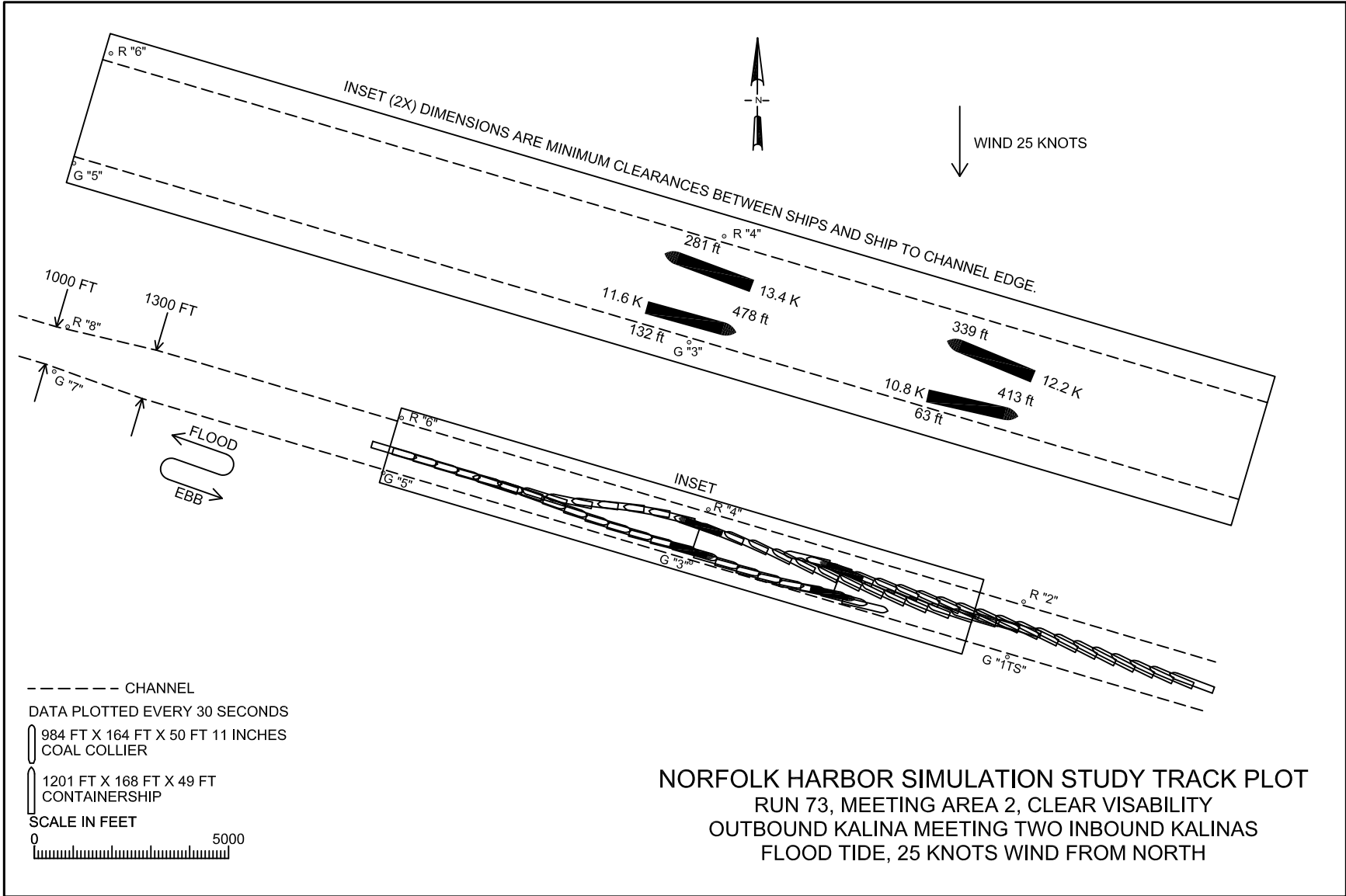
NORFOLK HARBOR SIMULATION STUDY TRACK PLOT  
 RUN 8, MEETING AREA 2, CLEAR VISIBILITY  
 OUTBOUND KALINA MEETING TWO INBOUND KALINAS  
 FLOOD TIDE, 25 KNOTS WIND FROM NORTH

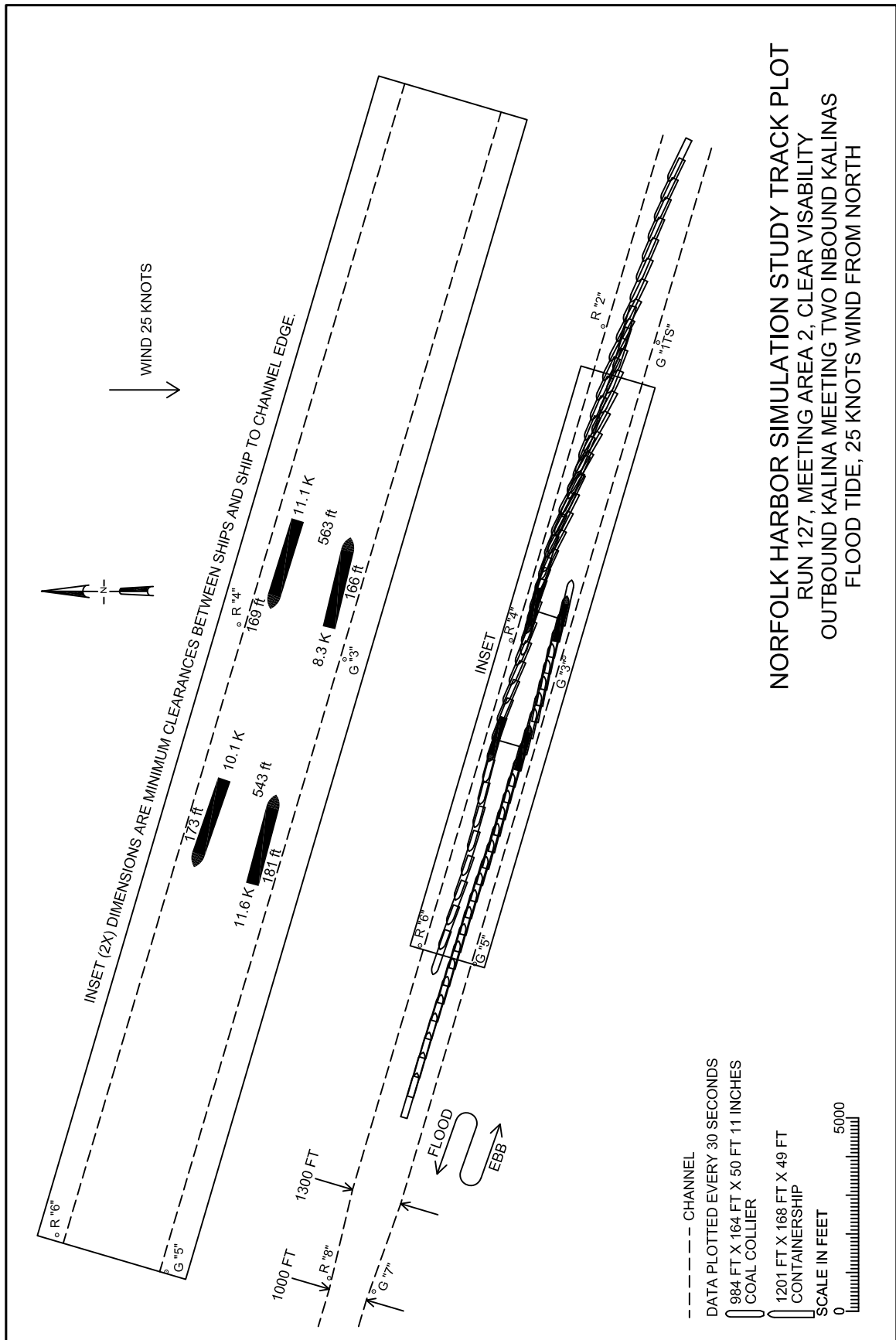


**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 16, MEETING AREA 2, CLEAR VISIBILITY  
 OUTBOUND KALINA MEETING TWO INBOUND KALINAS  
 FLOOD TIDE, 25 KNOTS WIND FROM NORTH

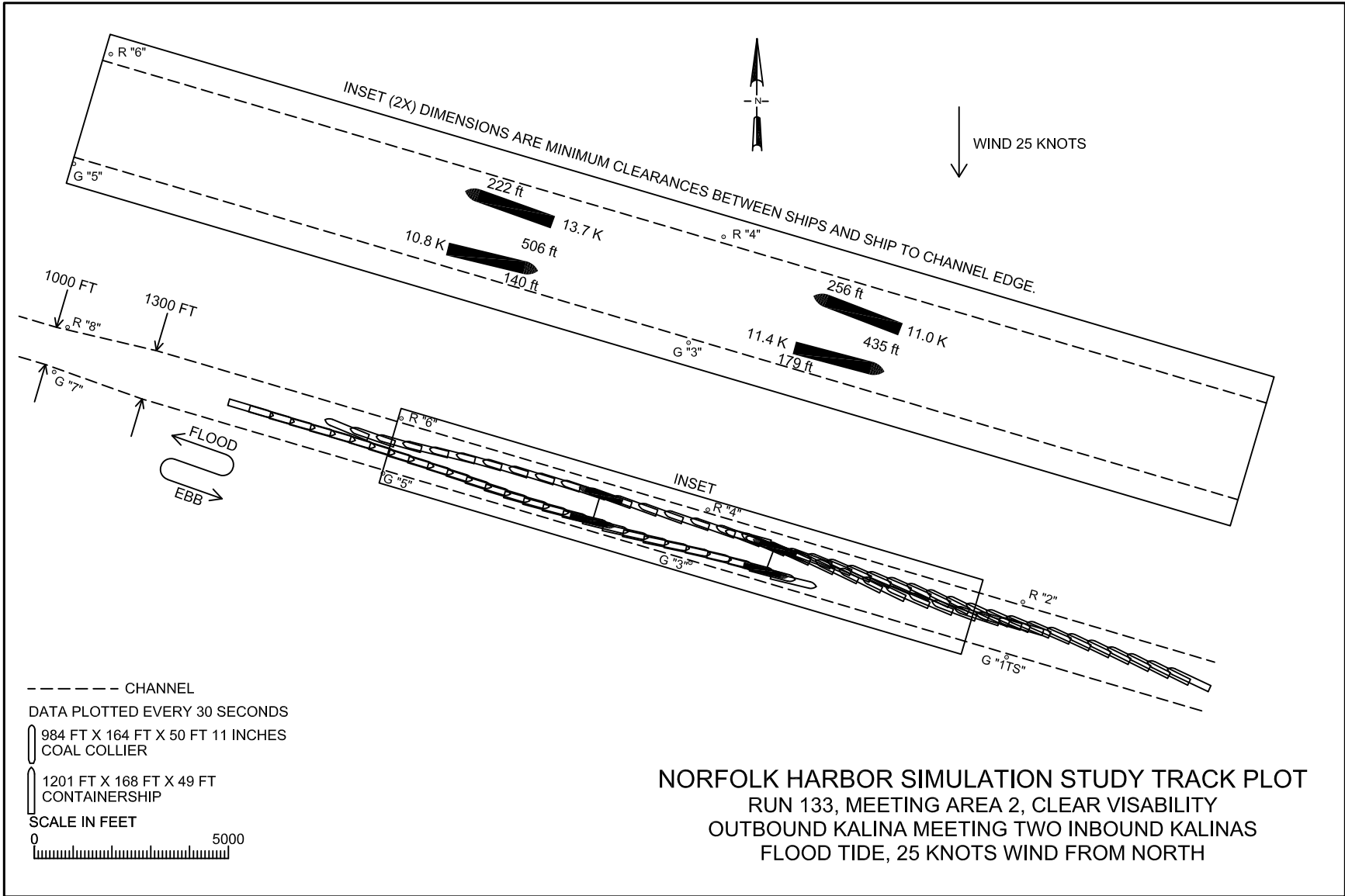


**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 67, MEETING AREA 2, CLEAR VISIBILITY  
 OUTBOUND KALINA MEETING TWO INBOUND KALINAS  
 FLOOD TIDE, 25 KNOTS WIND FROM NORTH





**NORFOLK HARBOR SIMULATION STUDY TRACK PLOT**  
 RUN 127, MEETING AREA 2, CLEAR VISIBILITY  
 OUTBOUND KALINA MEETING TWO INBOUND KALINAS  
 FLOOD TIDE, 25 KNOTS WIND FROM NORTH



## **Appendix D: Final Pilot Questionnaires**

NORFOLK HARBOR PED PILOT FINAL EVALUATION REALISM RATINGS AND COMMENTS

Date: 17 OCT 2018	Pilot/Captain: CHAD JAMISON
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SECTION A = REALISM OF SIMULATION	"REALISM" Rating Scale	1=Unrealistic	5=Average	10=Excellent
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MSC Kalina Class Ship Model Realism		(Circle Choice)										Increasing Realism□□□		
1.	MSC Kalina 49' Draft	1	2	3	4	5	6	7	8	9	10			
2.	Bulk Zhong Xing Hai 50' 11" Draft	1	2	3	4	5	6	7	8	9	10			

Comments

BOTH SHIPS SEEM TO ACCURATELY REPRESENT WHAT WE MIGHT SEE IN "REAL WORLD" CONDITIONS. WE HAVE NOT HAD THE BENEFIT OF SUCH EXPERIENCES YET, BUT I ANTICIPATE SIMILAR RESPONSES.

Containership seems to act like a real vessel under most circumstances.

Environmental Conditions Realism		(Circle Choice) Increasing Realism□□□									
3.	Flood	1	2	3	4	5	6	7	8	9	10
4.	Ebb	1	2	3	4	5	6	7	8	9	10
5.	Wind	1	2	3	4	5	6	7	8	9	10
6.	Visibility	1	2	3	4	5	6	7	8	9	10

Comments: SOMETIMES IT IS DIFFICULT TO DETERMINE WHICH ENVIRONMENTAL CONDITION IS EFFECTING THE SHIP THE MOST... BUT SUCH ARE THE CIRCUMSTANCES IN "REAL LIFE" THE SIMULATOR PROVIDED AN ACCURATE REPRESENTATION

Database Channel Realism		(Circle Choice) Increasing Realism□□□									
7.	Thimble Shoal Channel	1	2	3	4	5	6	7	8	9	10
8.	Norfolk Harbor Area	1	2	3	4	5	6	7	8	9	10
9.	Newport News Area	1	2	3	4	5	6	7	8	9	10

Comments: IT IS OFTEN DIFFICULT TO RECREATE THE NUANCES OF THE WAY SHIPS BEHAVE IN CERTAIN PORTIONS OF DIFFERENT CHANNELS. THE SIMULATOR DOES AN ADEQUATE JOB OF REPRESENTING WHAT WE OBSERVE. THE NORFOLK HARBOR ENTRANCE REACH MAY HAVE REVEALED CERTAIN INCONSISTENCIES IN THE DATA BASE. INITIALLY, BUT THOSE SEEM TO HAVE GOTTEN RESOLVED.

Section B = Safety of Maneuver in Real-Word Conditions	Overall "SAFETY" Rating Scale	1=Unsafe	5=Average	10=Very Safe
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Overall Safety of for this Transit in the tested conditions?		(Circle Choice)					Increasing Safety□□□				
1.	MSC Kaline 49' Draft	1	2	3	4	5	6	7	8	9	10
2.	Bulk Zhong Xing Hai 50' 11" Draft	1	2	3	4	5	6	7	8	9	10

Based upon your simulator runs, do you feel the channel improvements function as intended and do you think you will be able to perform the same maneuvers in real life once the improvements are constructed? *THOUGH I DO NOT YET HAVE THE BENEFIT OF SUCH EXPERIENCES TO DRAW ON, I BELIEVE THE SIMULATOR RUNS INDICATE THE CHANNEL IMPROVEMENTS WILL FUNCTION AS INTENDED. ~~AND~~ THE MANEUVERS ON THE SIMULATOR INDICATE THAT THESE SITUATIONS IN REAL LIFE WILL BE VERY CHALLENGING, BUT OUGHT TO BE ABLE TO BE EXECUTED SAFELY.*

Also any other additional comments.

*THE INTERACTION BETWEEN MEETING SHIP MODELS OFTEN REQUIRED ~~ADVANCED~~ APPLICATIONS OF RUDDER AND RELIANCE ON INCREASED HORSEPOWER... BOTH OF WHICH WOULD CREATE AN "UNCOMFORTABLE" SITUATION ON THE BRIDGE. IT IS UNUSUAL TO HAVE SUCH EXTREMES IN REAL LIFE. HOWEVER, EVEN UNDER THESE CONDITIONS, MEETINGS WERE SAFELY PERFORMED.*

NORFOLK HARBOR PED PILOT FINAL EVALUATION REALISM RATINGS AND COMMENTS

Date:	10/17/18	Pilot/Captain:	KEITH HOPE
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SECTION A = REALISM OF SIMULATION	"REALISM" Rating Scale	1=Unrealistic	5=Average	10=Excellent
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MSC Kalina Class Ship Model Realism		(Circle Choice)										Increasing Realism□□□		
1.	MSC Kalina 49' Draft	1	2	3	4	5	6	7	8	9	10			
2.	Bulk Zhong Xing Hai 50' 11" Draft	1	2	3	4	5	6	7	8	9	10			

Comments

We simulated the Kalina on 18 trials and the bulk carrier on 3-4 runs. Bulk ships are less responsive and the simulator responded accordingly.  
 The Kalina handles like a 1300' vessel may respond in a narrow channel.

Containership seems to act like a real vessel would under most circumstances.

Environmental Conditions Realism		(Circle Choice)										Increasing Realism□□□		
3.	Flood	1	2	3	4	5	6	7	8	9	10			
4.	Ebb	1	2	3	4	5	6	7	8	9	10			
5.	Wind	1	2	3	4	5	6	7	8	9	10			
6.	Visibility	1	2	3	4	5	6	7	8	9	10			

Comments: On some trials the vessel responded differently to what would be expected from the wind. °7-8 swept path. Overall, however, the simulator was very accurate. Hence the 9<sup>1/2</sup> for realism.

Database Channel Realism		(Circle Choice)										Increasing Realism□□□		
7.	Thimble Shoal Channel	1	2	3	4	5	6	7	8	9	10			
8.	Norfolk Harbor Area	1	2	3	4	5	6	7	8	9	10			
9.	Newport News Area	1	2	3	4	5	6	7	8	9	10			

Comments: The channels of Norfolk Harbor and Newport News were very realistic. On these runs, there was no interaction with other vessels. On the trials in Thimble Shoals we had multiple meeting scenarios. Ship interaction is paramount, and the I have never piloted ships of this length or depth in a narrow channel. My comments are based on what I have experienced in my piloting career thus far.

<b>Section B = Safety of Maneuver in Real-Word Conditions</b>	<b>Overall "SAFETY" Rating Scale</b>	<b>1=Unsafe</b>	<b>5=Average</b>	<b>10=Very Safe</b>
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Overall Safety of for this Transit in the tested conditions?		(Circle Choice) Increasing Safety □□□									
1.	MSC Kaline 49' Draft	1	2	3	4	5	6	7	8	9	10
2.	Bulk Zhong Xing Hai 50' 11" Draft	1	2	3	4	5	6	7	8	9	10

Based upon your simulator runs, do you feel the channel improvements function as intended and do you think you will be able to perform the same maneuvers in real life once the improvements are constructed?

Meeting in Thimble Shoal Channel east of bridge tunnel, the interaction between 2 Kalina Class ships drawing 49' is dramatic. I am able to simulate the meetings, but in real life would feel uncomfortable and concerned with the parameters and conditions I simulated. We met at speeds I currently feel comfortable meeting others

Also any other additional comments.

vessels of much less length and draft. Currently 1200' ships have one way navigation in Thimble Channel. I am simulating 1300' vessels meeting in a narrow channel under upper limits of navigation. Wind, current, seas. I rarely use hard over rudder and full ahead and during the simulations it was necessary. I feel comfortable ~~that~~ in the simulator.

NORFOLK HARBOR PED PILOT FINAL EVALUATION REALISM RATINGS AND COMMENTS

Date:	10/24/18	Pilot/Captain:	DAVID WARE
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SECTION A = REALISM OF SIMULATION	"REALISM" Rating Scale	1=Unrealistic	5=Average	10=Excellent
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MSC Kalina Class Ship Model Realism		(Circle Choice) Increasing Realism□□□									
1.	MSC Kaline 49' Draft	1	2	3	4	5	6	7	8	9	10
2.	Bulk Zhong Xing Hai 50' 11" Draft	1	2	3	4	5	6	7	8	9	10

Comments

BULKER SQUAT APPEARED TO BE EXAGGERATED

Containership seems to act like a real vessel under most circumstances.

Environmental Conditions Realism		(Circle Choice) Increasing Realism□□□									
3.	Flood	1	2	3	4	5	6	7	8	9	10
4.	Ebb	1	2	3	4	5	6	7	8	9	10
5.	Wind	1	2	3	4	5	6	7	8	9	10
6.	Visibility	1	2	3	4	5	6	7	8	9	10

Comments:

Database Channel Realism		(Circle Choice) Increasing Realism□□□									
7.	<i>Thimble Shoal Channel</i>	1	2	3	4	5	6	7	8	9	10
8.	<i>Norfolk Harbor Area</i>	1	2	3	4	5	6	7	8	9	10
9.	<i>Newport News Area</i>	1	2	3	4	5	6	7	8	9	10

Comments:

<b>Section B = Safety of Maneuver in Real-Word Conditions</b>	<b>Overall "SAFETY" Rating Scale</b>	<b>1=Unsafe</b>	<b>5=Average</b>	<b>10=Very Safe</b>
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Overall Safety of for this Transit in the tested conditions?		(Circle Choice) Increasing Safety□□□									
1.	MSC Kaline 49' Draft	1	2	3	4	5	6	7	8	9	10
2.	Bulk Zhong Xing Hai 50' 11" Draft	1	2	3	4	5	6	7	8	9	10

Based upon your simulator runs, do you feel the channel improvements function as intended and do you think you will be able to perform the same maneuvers in real life once the improvements are constructed?

YES, IMPROVEMENTS FUNCTION AS INTENDED.

YES SAME MANEUVERS CAN BE PERFORMED

Also any other additional comments.

NORFOLK HARBOR PED PILOT FINAL EVALUATION REALISM RATINGS AND COMMENTS

Date:	10-24-18	Pilot/Captain:	Chisman
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SECTION A = REALISM OF SIMULATION	"REALISM" Rating Scale	1=Unrealistic	5=Average	10=Excellent
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MSC Kalina Class Ship Model Realism		(Circle Choice) Increasing Realism□□□									
1.	MSC Kaline 49' Draft	1	2	3	4	5	6	7	8	9	10
2.	Bulk Zhong Xing Hai 50' 11" Draft	1	2	3	4	5	6	7	8	9	10

Comments

Both vessels seemed to have accurate ship interaction. Bank effect was minimal which I think is accurate in the wider channels because of the margin of safety.

Containership seems to act like a real vessel would under most circumstances.

Environmental Conditions Realism		(Circle Choice) Increasing Realism□□□									
3.	Flood	1	2	3	4	5	6	7	8	9	10
4.	Ebb	1	2	3	4	5	6	7	8	9	10
5.	Wind	1	2	3	4	5	6	7	8	9	10
6.	Visibility	1	2	3	4	5	6	7	8	9	10

Comments:

Database Channel Realism		(Circle Choice) Increasing Realism□□□									
7.	<i>Thimble Shoal Channel</i>	1	2	3	4	5	6	7	8	9	10
8.	<i>Norfolk Harbor Area</i>	1	2	3	4	5	6	7	8	9	10
9.	<i>Newport News Area</i>	1	2	3	4	5	6	7	8	9	10

Comments:

Section B = Safety of Maneuver in Real-Word Conditions	Overall "SAFETY" Rating Scale	1=Unsafe	5=Average	10=Very Safe
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Overall Safety of for this Transit in the tested conditions?		(Circle Choice) Increasing Safety□□□									
1.	MSC Kaline 49' Draft	1	2	3	4	5	6	7	8	9	10
2.	Bulk Zhong Xing Hai 50' 11" Draft	1	2	3	4	5	6	7	8	9	10

Based upon your simulator runs, do you feel the channel improvements function as intended and do you think you will be able to perform the same maneuvers in real life once the improvements are constructed?

MSC Kaline performed well in the 1300' and 1400' channels <sup>and 56' deep</sup> as intended.

The bulk carrier handled well in the channel improvements

Also any other additional comments.

Date: 11/6/18	Pilot/Captain: JACOB JOHNSON
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SECTION A = REALISM OF SIMULATION	"REALISM" Rating Scale	1=Unrealistic	5=Average	10=Excellent
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MSC Kalina Class Ship Model Realism		(Circle Choice) Increasing Realism □□□									
1.	MSC Kaline 49' Draft	1	2	3	4	5	6	7	8	9	10
2.	Bulk Zhong Xing Hai 50' 11" Draft	1	2	3	4	5	6	7	8	9	10

Comments SHIPS BOTH HANDLE AND PERFORM WELL AND SIMILAR TO 14,000 TON & DEEP LOADED SHIPS IN HAMPTON ROADS. THE SPEED THAT THE KALINE MAKES AT 49' IS A LITTLE OFF

NORFOLK HARBOR PED PILOT FINAL EVALUATION REALISM RATINGS AND COMMENTS

Containership seems to act like a real vessel would under most circumstances.

YES VERY SIMILAR TO WHAT I'VE EXPERIENCED ON  
14,000 VESSEL

Environmental Conditions Realism		(Circle Choice) Increasing Realism□□□									
3.	Flood	1	2	3	4	5	6	7	8	9	10
4.	Ebb	1	2	3	4	5	6	7	8	9	10
5.	Wind	1	2	3	4	5	6	7	8	9	10
6.	Visibility	1	2	3	4	5	6	7	8	9	10

Comments:

Database Channel Realism		(Circle Choice) Increasing Realism□□□									
7.	<i>Thimble Shoal Channel</i>	1	2	3	4	5	6	7	8	9	10
8.	<i>Norfolk Harbor Area</i>	1	2	3	4	5	6	7	8	9	10
9.	<i>Newport News Area</i>	1	2	3	4	5	6	7	8	9	10

Comments:

Section B = Safety of Maneuver in Real- Word Conditions	Overall "SAFETY" Rating Scale	1=Unsafe	5=Average	10=Very Safe
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Overall Safety of for this Transit in the tested conditions?		(Circle Choice) Increasing Safety□□□									
1.	MSC Kaline 49' Draft	1	2	3	4	5	6	7	8	9	10
2.	Bulk Zhong Xing Hai 50' 11" Draft	1	2	3	4	5	6	7	8	9	10

Based upon your simulator runs, do you feel the channel improvements function as intended and do you think you will be able to perform the same maneuvers in real life once the improvements are constructed?

YES. I FEEL THAT THE IMPROVEMENTS WE TESTED  
WILL ALLOW FOR TWO WAY TRAFFIC IN THE  
AREAS

Also any other additional comments.

Date:	11/6/2018	Pilot/Captain:	E. WRIGHTSTILL AVERY
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SECTION A = REALISM OF SIMULATION	"REALISM" Rating Scale	1=Unrealistic	5=Average	10=Excellent
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MSC Kalina Class Ship Model Realism		(Circle Choice) Increasing Realism □□□									
1.	MSC Kaline 49' Draft	1	2	3	4	5	6	7	8	9	10
2.	Bulk Zhong Xing Hai 50' 11" Draft	1	2	3	4	5	6	7	8	9	10

Comments

NORFOLK HARBOR PED PILOT FINAL EVALUATION REALISM RATINGS AND COMMENTS

Containership seems to act like a real vessel would under most circumstances.

YES

Environmental Conditions Realism		(Circle Choice) Increasing Realism□□□									
3.	Flood	1	2	3	4	5	6	7	8	9	10
4.	Ebb	1	2	3	4	5	6	7	8	9	10
5.	Wind	1	2	3	4	5	6	7	8	9	10
6.	Visibility	1	2	3	4	5	6	7	8	9	10

Comments:

Database Channel Realism		(Circle Choice) Increasing Realism□□□									
7.	<i>Thimble Shoal Channel</i>	1	2	3	4	5	6	7	8	9	10
8.	<i>Norfolk Harbor Area</i>	1	2	3	4	5	6	7	8	9	10
9.	<i>Newport News Area</i>	1	2	3	4	5	6	7	8	9	10

Comments:

Section B = Safety of Maneuver in Real- Word Conditions	Overall "SAFETY" Rating Scale	1=Unsafe	5=Average	10=Very Safe
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Overall Safety of for this Transit in the tested conditions?		(Circle Choice) Increasing Safety□□□									
1.	MSC Kaline 49' Draft	1	2	3	4	5	6	7	8	9	10
2.	Bulk Zhong Xing Hai 50' 11" Draft	1	2	3	4	5	6	7	8	9	10

AT SLOW SPEEDS

Based upon your simulator runs, do you feel the channel improvements function as intended and do you think you will be able to perform the same maneuvers in real life once the improvements are constructed?

YES I DO. THE ADDITIONAL SEA ROOM  
ALLOWS FOR SAFE PASSING DESPITE  
THE "CRABBING" OR INCREASED SWEEP  
PATH CAUSED BY THE ENVIRONMENTAL  
CONDITIONS (BOTH WIND & CURRENT)

Also any other additional comments.

## **Appendix E: Pilot Comment Sheets**

Appendix E  
Pilot Comment Sheets

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Pilot: <b>KEITH HOPE</b>	Run No.: <b>1</b>	Date: <b>10/15/18</b>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	<input checked="" type="checkbox"/> Container Kalina_Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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<b>Wind Direction / Speed (kt):</b>	<b>25 kts. NE</b>
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<b>Current Direction/ Speed (kt):</b>	<input type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	<b>1.4 kts.</b>
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<b>Swell: Dir. From/Height</b>	<b>3-4'</b>	<b>Seas:</b>	<b>Dir. From/Height 3/4'</b>
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<b>Visibility:</b>	Day - Clear <b>5 miles overcast</b>
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<b>Assist Tugs Bollard Pulls:</b>	<b>NA</b>
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<b>Transit To / From:</b>	<b>CH - VIG</b>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

**Yes**

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

**3° Thimble Channel**

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

**NA**

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

**Yes 11/12 Thimble anomaly**

5. Did you maintain an acceptable distance from the shoals?

**Yes 1 way navigation middle - 150 ft. of center**

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

**No**

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													
NA													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty				1	2	3	4	5	6	7.5	8	9	10

Overall Safety of Run for Tested Conditions													
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe						
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.												
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.												
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.												
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions												
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions												
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe						
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
Overall Safety				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													
Green buoys very hard to see. Overcast.													

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Pilot: <u>JAMISON</u>	Run No.: <u>2</u>	Date: <u>15 OCT 2018</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A- Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>SW 25 KNOTS</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height		Seas: Dir. From/Height
Visibility:	<input checked="" type="checkbox"/> Day - Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>CAPE HENRY TO VIG</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>5-10 DEGREES OF LEEWAY IN WIND, REALISTIC</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>YES</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES LEEWAY FOR WINDS @ CERTAIN SPEEDS WAS ACCURATE</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
N/A										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
<p>ON VESSELS OF THIS SIZE, WE USE A TETHERED TUG CENTER LEAD AFT INSIDE OLD PT. COMFORT. WOULD HAVE BEEN VERY HELPFUL IN THESE WINDY CONDITIONS.</p>										

**Norfolk**  
**Pilot Run Evaluation**  
**October and November 2018**

Pilot: <b>KEITH HOPE</b>	Run No.: <b>2</b>	Date: <b>10/15/18</b>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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<b>Wind Direction / Speed (kt):</b>	<b>SW 25 kts.</b>
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<b>Current Direction/ Speed (kt):</b>	Max flood <input checked="" type="checkbox"/> Max ebb <b>20 kts.</b>
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<b>Swell: Dir. From/Height</b>	<b>3/4'</b>	<b>Seas:</b>	<b>Dir. From/Height 3/4</b>
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<b>Visibility:</b>	<b>Day – Clear clear</b>
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<b>Assist Tugs Bollard Pulls:</b>	
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<b>Transit To / From:</b>	<b>CH – VIG</b>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

**Yes**

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

~~NA~~ **3°**

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

**NA**

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

**A little more swept path than expected.**

5. Did you maintain and acceptable distance from the shoals?

**Yes**

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

**No**

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
NA										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7.5	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
THIMBLE - up to 9° leeway max clb - Strong had to use 8/10° to hold steady - not far off										

**Norfolk**  
**Pilot Run Evaluation**  
**October and November 2018**

Pilot: <b>KEITH HOPE</b>	Run No.: <b>3</b>	Date: <b>10/15/18</b>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container Kalina_Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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<b>Wind Direction / Speed (kt):</b>	<b>NE 25 kts.</b>		
<b>Current Direction/ Speed (kt):</b>	<b>Max flood</b>	<b>Max ebb</b>	
<b>Swell: Dir. From/Height</b>	<b>3-4' NE</b>	<b>Seas:</b>	<b>Dir. From/Height 3-4'</b>
<b>Visibility:</b>	<b>Day → Clear</b>		

<b>Assist Tugs Bollard Pulls:</b>	<b>NA</b>
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<b>Transit To / From:</b>	<b>VIG Midstream - CBBT</b>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

**Yes**

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

**3°-4° except at start - NA**

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

**NA**

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

**Yes except at start -**

5. Did you maintain and acceptable distance from the shoals?

**Yes**

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

**No**

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average				10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
NA										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit				10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety				10=Very Safe				
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety				10=Most Safe				
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
<p style="font-size: 1.2em;">hammered at start of simulation - More accurate swept path for NE wind. Amount of rudder needed a little large at times but accurate for most of transit.</p>										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>JAMISON</u>	Run No.: <u>4</u>	Date: <u>10/15/2018</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A - Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>SW 25 KNOTS</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb	
Swell: Dir. From/Height	Seas:	Dir. From/Height
Visibility: <u>Day - Clear</u>		
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>NIG - CBBT</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>NO. SWUNG WIDE OF COG OUTSIDE CHANNEL BOUNDARIES BETWEEN F/G ANCHORAGES</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>1° LEEWAY</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>NO, PILING UP</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>NO</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>YES, STAY IN CHANNEL</u>		

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average				10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
N/A										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit				10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety				10=Very Safe				
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety				10=Most Safe				
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Pilot: <u>JAMISON</u>	Run No.: <u>5</u>	Date: <u>10/15/2018</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	<u>Container Kalina_Norfolk A - Draft 14.9 m / 49 ft</u> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>SW 25 KNOTS</u>	
Current Direction/ Speed (kt):	<u>Max flood</u> <u>Max ebb</u>	
Swell: Dir. From/Height		Seas: Dir. From/Height
Visibility:	<u>Day - Clear</u>	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>BUOY "4EP" TO THIMBLE LIGHT</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>20 DEGREE</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>YES</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
N/A										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10
(3)										

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
USING MORE RUDDER THAN COMMON PRACTICE, BUT IS LIKELY DUE TO DRAFT. SATISFACTORY RUN										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Vessel 1

Pilot: JAMISON (INBOUND KALINA) (MEETING ZATBUND) KALINA	Run No.: 6	Date: 10/15/2018
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A - Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast

Wind Direction / Speed (kt):	South 25 knots
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Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb
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Swell: Dir. From/Height	N/A	Seas:	Dir. From/Height
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Visibility:	Day - Clear
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Assist Tugs Bollard Pulls:	N/A
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Transit To / From:	1/2 THIMBLE TO 7/8 THIMBLE
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

2/3° LEEWAY

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

YES

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

SOMEWHAT. NO CUSHION WHEN BOWS MET

5. Did you maintain an acceptable distance from the shoals?

YES.

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													
N/A													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty				1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions													
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe						
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.												
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.												
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.												
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions												
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions												
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe						
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
Overall Safety				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

Norfolk  
Pilot Run Evaluation  
October and November 2018

vessel ~~10~~ 2

Pilot:	KEITH HOPE		Run No.:	6	Date:	10/15/18
Please Circle Conditions. Answer only questions that are applicable to the exercise.						
Model:	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft				<input type="checkbox"/> Loaded	
					<input type="checkbox"/> Ballast	
Wind Direction / Speed (kt):	S 25 kts.					
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb					
Swell: Dir. From/Height	3-4'		Seas:	Dir. From/Height		
Visibility:	Day <input checked="" type="checkbox"/> Clear					
Assist Tugs Bollard Pulls:	NA					
Transit To / From:	Thimble Buoy 5-6 - 1-2					
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)						
Yes						
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?						
NA						
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?						
NA						
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?						
No wind set wasn't enough						
5. Did you maintain an acceptable distance from the shoals?						
Yes						
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?						
No						

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
<b>Tug Configuration and Reserve Capacity</b>	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
<b>Overall Difficulty</b>	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
<b>Overall Safety</b>	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
<p style="font-size: 1.2em; color: blue;">OUT BOUND 1 - seemed a little late on cushion and suction, but felt it. The suction took longer on hard over than anticipated. 10.3kts</p>										

Norfolk  
Pilot Run Evaluation  
October and November 2018

vessel ~~2~~ 3

Pilot: <b>KEITH HOPE</b>	Run No.: <b>6</b>	Date: <b>10/15/18</b>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	Container Kalina_Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<b>S 25 kts</b>	
Current Direction/ Speed (kt):	Max flood Max ebb	
Swell: Dir. From/Height	<b>3-4'</b>	Seas: Dir. From/Height
Visibility:	Day - <b>Clear</b>	
Assist Tugs Bollard Pulls:	<b>NA</b>	
Transit To / From:	<b>Booy 5-B</b>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<b>Yes</b>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<b>NA</b>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<b>NA</b>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<b>Yes</b>		
5. Did you maintain and acceptable distance from the shoals?		
<b>Yes</b>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<b>No</b>		

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Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate				5=Average			10=Most Adequate		
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult				5=Difficulty of an Average Transit			10=Most Difficult		
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety				10=Very Safe		
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety				10=Most Safe		
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
<p style="font-family: cursive; color: blue;">OUTBOUND 2 - met at 7.3 kts. less interaction between vessels - I think Inboard was a little closer on this meeting situation.</p>										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Vessel 1

Pilot: JAMISON	Run No.: 7	Date: 10/15/2018
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A - Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded
	INBOUND KALINA MEETING ZOUTBOUND KALINAS	<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	25 KNOT SOUTH	
Current Direction/ Speed (kt):	Max flood Max ebb	
Swell: Dir. From/Height	N/A	Seas: Dir. From/Height
Visibility:	Day - Clear	
Assist Tugs Bollard Pulls:	N/A	
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
YES		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
3° LEEWAY		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
YES		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
YES		
5. Did you maintain an acceptable distance from the shoals?		
YES		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
NO		

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average				10=Most Adequate		
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
N/A										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit				10=Most Difficult		
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety				10=Very Safe		
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety				10=Most Safe		
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Vessel 2

Pilot: <b>KEITH HOPE</b>	Run No.: <b>7</b>	Date: <b>10/15/18</b>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<b>S 25 kts</b>	
Current Direction/ Speed (kt):	Max flood <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Max ebb</span>	
Swell: Dir. From/Height	<b>3-4'</b>	Seas: Dir. From/Height
Visibility:	Day – <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Clear</span>	
Assist Tugs Bollard Pulls:	<b>NA</b>	
Transit To / From:	<b>Thimble #5-1</b>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<b>Yes</b>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<b>NA</b>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<b>NA</b>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<b>Yes more southern wind reaction</b>		
5. Did you maintain an acceptable distance from the shoals?		
<b>Yes - maybe</b>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<b>No</b>		

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Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average				10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
NA										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit				10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety				10=Very Safe				
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety				10=Most Safe				
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
<p>11.3kts OUTBOUND 1 - STEERING 114°T to make 110°T. got too far on southside of channel - near shoal waters. Interactions were accurate - left port rudder on too long after meeting. 350' apart</p>										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Vessel 3

Pilot: KEITH HOPE	Run No.: 7	Date: 10/15/18
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

Model:	Container Kalina_Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast

Wind Direction / Speed (kt):	S 25 kts
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Current Direction/ Speed (kt):	Max flood Max ebb
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Swell: Dir. From/Height	3-4'	Seas: Dir. From/Height
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Visibility:	Day - Clear
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Assist Tugs Bollard Pulls:	NA
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Transit To / From:	Buoy 5-1
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

Yes

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

NA

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

NA

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

Yes

5. Did you maintain and acceptable distance from the shoals?

Yes closer to center of channel

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

Yes closer to shoal water

Norfolk  
Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)		Increasing Adequacy → → →							
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													
NA													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)		Increasing Difficulty → → →							
Overall Difficulty				1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions											
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe				
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.										
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.										
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.										
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions										
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions										
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe				

10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)		Increasing Safety → → →							
Overall Safety				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													
<p>OUTBOUND 2: Closer to centerline 8.4 lfs - interactions were good - felt I safely met Chard &amp; had it under control. - vessel took another dive to port. 310' Apart</p>													

Norfolk  
Pilot Run Evaluation  
October and November 2018

VI

Pilot: <b>KEITH HOPE</b>	Run No.: <b>8</b>	Date: <b>10/15/18</b>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast

**Wind Direction / Speed (kt):**     ~~N~~     **25kts**

**Current Direction/ Speed (kt):**     Max flood  
Max ebb

**Swell: Dir. From/Height**     **1 meter**     **Seas: Dir. From/Height**

**Visibility:**     Day – Clear

**Assist Tugs Bollard Pulls:**     **NA**

**Transit To / From:**     **5-1 Thimble**

1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

**Yes**

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

**NA**

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

**NA**

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

**Yes**

5. Did you maintain an acceptable distance from the shoals?

**No too close on 2<sup>ND</sup> Meeting**

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

**Yes closer to mid-channel**

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
NA										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
INBOUND #1 - 350 to rt. 9.6 kts - nice meeting INBOUND #2 400 to rt. 9.6 kts. steering 104° making 111°										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Vad  
13

Pilot: JAMISON	Run No.: 8	Date: 10/15/18
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A - Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	N 25
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Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb
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Swell: Dir. From/Height	1 METER / NORTH	Seas:	Dir. From/Height
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Visibility:	Day - Clear
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Assist Tugs Bollard Pulls:	
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Transit To / From:	
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

2-3°

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

YES

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

A LITTLE LESS SHIP-TO-SHIP THAN EXPECTED

5. Did you maintain and acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

**Norfolk**  
**Pilot Run Evaluation**  
**October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy →→→									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
N/A										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty →→→									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety →→→									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
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✓

Pilot: <b>KEITH HOPE</b>	Run No.: <b>9</b>	Date: <b>10/15/18</b>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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<b>Wind Direction / Speed (kt):</b>	<b>N 25</b>
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<b>Current Direction/ Speed (kt):</b>	Max flood <input checked="" type="checkbox"/> Max ebb
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<b>Swell: Dir. From/Height</b>	<b>1 meter</b>	<b>Seas:</b>	<b>Dir. From/Height</b>
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<b>Visibility:</b>	Day – <input checked="" type="checkbox"/> Clear
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<b>Assist Tugs Bollard Pulls:</b>	<b>NA</b>
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<b>Transit To / From:</b>	<b>Buoy 5-1</b>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

Yes

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

NA

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

NA

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

Yes

5. Did you maintain an acceptable distance from the shoals?

Yes

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

No

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average				10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
NA										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit				10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety				10=Very Safe				
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety				10=Most Safe				
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
<p style="font-size: 1.2em;">Very little wind reaction at start of simulation. Started to build - met Inbound #1 at 10.4 knots. comfortable distant met inbound #2 at 12 kts. - comfortable distance and reaction.</p>										

Norfolk  
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✓

Pilot: JAMISON	Run No. 9	Date: 10/15/18
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<div style="border: 1px solid black; border-radius: 50%; padding: 2px; display: inline-block;">Container Kalina_Norfolk A- Draft 14.9 m / 49 ft</div> <div style="border: 1px solid black; border-radius: 50%; padding: 2px; display: inline-block;"><del>Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft</del></div> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	N 25	
Current Direction/ Speed (kt):	<div style="border: 1px solid black; border-radius: 50%; padding: 2px; display: inline-block;"><del>Max flood</del></div> <div style="border: 1px solid black; border-radius: 50%; padding: 2px; display: inline-block;">Max ebb</div>	
Swell: Dir. From/Height	T.M / N	Seas: Dir. From/Height
Visibility:	Day - Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
YES		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
2-3°		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
YES		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
A LITTLE LESS SHIP TO SHIP THAN EXPECTED		
5. Did you maintain an acceptable distance from the shoals?		
YES		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
NO		

**Norfolk  
Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average				10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy →→→→									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
N/A										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit				10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty →→→→									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety				10=Very Safe				
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety				10=Most Safe				
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety →→→→									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

✓

Pilot: <b>KEITH HOPE</b>	Run No.: <b>10</b>	Date: <b>10/16/18</b>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

Model:	Container <u>Kalina</u> Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	<b>N 25 kts.</b>
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Current Direction/ Speed (kt):	<u>Max flood</u> Max ebb
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Swell: Dir. From/Height	<b>1 meter</b>	Seas:	Dir. From/Height
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Visibility:	<u>Day - Clear</u>
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Assist Tugs Bollard Pulls:	<b>NA</b>
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Transit To / From:	<b>Thimble Buoy 1-5 inbound</b>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

**Yes**

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

**Yes maybe 1 degree higher than expected 5° leeway**

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

**Yes wind had too great an impact**

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

**No wind**

5. Did you maintain an acceptable distance from the shoals?

**No too close**

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

**Yes closer to centerline**

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy →→→									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
NA										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty →→→									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety →→→									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
<p style="font-size: 1.2em;">INBOUND - I kept 30° of port rudder, 293 to maintain heading of 288° T. The wind should have been 10-15° and because I was on edge of shoal - would expect sheer to port and would need 5thd. rudder. 10.4-11kts.</p>										

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Pilot Run Evaluation  
October and November 2018

12/13

Pilot: <u>JAMISON</u>	Run No.: <u>10</u>	Date: <u>10/16/2018</u>
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

Model:	<del>Container Kalina_Norfolk A - Draft 14.9 m / 49 ft</del> <u>Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft</u> <u>XZ OUTBOUND</u> <del>Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft</del>	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	<u>N 25 KTS</u>
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Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb
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Swell: Dir. From/Height	Seas:	Dir. From/Height <u>N/4 FT</u>
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Visibility:	<u>Day - Clear</u>
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Assist Tugs Bollard Pulls:	
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Transit To / From:	<u>7/8 THIMBLE TO 1/2 THIMBLE</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)  
  
YES
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?  
  
VERY LITTLE CURRENT
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?  
  
YES
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?  
  
YES
5. Did you maintain an acceptable distance from the shoals?  
  
YES
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?  
  
No.

**Norfolk  
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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
N/A										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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October and November 2018



Pilot: <b>KEITH HOPE</b>	Run No.: <b>11</b>	Date: <b>10/16/18</b>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container <b>Kalina</b> _Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast

<b>Wind Direction / Speed (kt):</b>	<b>S 10 kts</b>
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<b>Current Direction/ Speed (kt):</b>	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb
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<b>Swell: Dir. From/Height</b>	<b>1 meter</b>	<b>Seas:</b>	<b>Dir. From/Height</b>
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<b>Visibility:</b>	Day - Clear	<b>1/2 mile</b>
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<b>Assist Tugs Bollard Pulls:</b>	<b>NA</b>
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<b>Transit To / From:</b>	<b>Buoy 1-5 Thimble Channel</b>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

Yes

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

Yes

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

Yes

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

No After meeting outbound #1 took a sheer.

5. Did you maintain and acceptable distance from the shoals?

Yes

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

Yes I would meet outbound #2 on 1 whistle.

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
NA										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10
<div style="display: flex; justify-content: space-around; font-style: italic;"> <span>to outbound #1</span> <span>After outbound #1</span> </div>										

Overall Safety of Run for Tested Conditions			
Explanation of Scale	1=Unsafe	5=Average Safety	10=Very Safe
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.		
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.		
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.		
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions		
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions		
Safety Rating Scale	1=Unsafe	5=Average Safety	10=Most Safe

10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
Inbound - met closer to centerline - dramatic effect after meeting outbound #1, met outbound #2 stbd-stbd after. Successful meeting but not accurate.										

Norfolk  
Pilot Run Evaluation  
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J2 x J3

Pilot: JAMISON	Run No.: 11	Date: 10/16/2018
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container Kalina_Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A- Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	S 10 KTS	
Current Direction/ Speed (kt):	Max flood Max ebb	
Swell: Dir. From/Height	Seas:	Dir. From/Height S / 1 FT
Visibility:	Day - Clear 1/2 MILE	
Assist Tugs Bollard Pulls:		
Transit To / From:	CBBT TO 1/2 THUMBLE	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
PARTIALLY. OUTBOUND 1 OK " " 2 TO MANEUVER TO MEET SAFELY WE HAD TO CROSS CHANNEL AND EXITED CHANNEL BOUNDARIES		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
NOT MUCH LEEWAY		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
CROSSING CHANNEL MADE SAFE MEETING, BUT BOTH VESSELS HAD TO EXIT CHANNEL BOUNDARIES		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
YES		
5. Did you maintain an acceptable distance from the shoals?		
NO		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
YES. MEET INBOUND MORE CLOSELY		

**Norfolk  
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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
N/A										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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Pilot: <b>KEITH HOPE</b>	Run No.: <b>12</b>	Date: <b>10/16/18</b>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container <u>Kalina</u> Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast

<b>Wind Direction / Speed (kt):</b>	<b>S 25kts</b>
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<b>Current Direction/ Speed (kt):</b>	<u>Max flood</u> Max ebb
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<b>Swell: Dir. From/Height</b>	<b>1 meter</b>	<b>Seas:</b>	<b>Dir. From/Height</b> <b>S</b>
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<b>Visibility:</b>	Day – <u>Clear</u>
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<b>Assist Tugs Bollard Pulls:</b>	<b>NA</b>
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<b>Transit To / From:</b>	
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

**Yes**

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

**10° 11.5 kts.**

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

**Yes wind not a factor**

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

**No I thought wind would have higher impact.**

5. Did you maintain an acceptable distance from the shoals?

**No too close to stbd side - picked me up.**

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

**Yes closer to centerline**

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
NA										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
INBOUND - Still too much interaction after passing Outboard #1. Inbound seemed to jump when meeting vessel, placed me closer to edge of channel.										

Norfolk  
Pilot Run Evaluation  
October and November 2018

↓3

Pilot: JAMISON	Run No.: (2(2))	Date: 10/16/2018
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

Model:	Container Kalina_Norfolk A - Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	S 25 KTS
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Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb
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Swell: Dir. From/Height	Seas:	Dir. From/Height S / 1M
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Visibility:	Day - <input checked="" type="checkbox"/> Clear
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Assist Tugs Bollard Pulls:	
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Transit To / From:	
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

3° - 4° LEEWAY DUE TO WIND

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

YES

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain and acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
N/A										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

✓

Pilot: <u>Keith Hope</u>	Run No.: <u>15</u>	Date: <u>10/16/18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container <u>Kalina</u> Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded
	<u>INBOUND</u>	<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>S 25 kts</u>	
Current Direction/ Speed (kt):	Max flood <u>Max ebb</u>	
Swell: Dir. From/Height	<u>1 meter</u>	Seas: Dir. From/Height
Visibility:	Day - <u>Clear</u>	
Assist Tugs Bollard Pulls:	<u>NA</u>	
Transit To / From:	<u>INBOUND Buoy 2-6</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>Yes</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>Yes 3° leeward</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>Yes</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>Yes No vessel outboard #2 took a sharper angle.</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>Yes</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>No</u>		

**Norfolk**  
**Pilot Run Evaluation**  
**October and November 2018**

Tug Adequacy Rating for Tested Conditions															
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate								
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.															
Tug Adequacy						(Circle Choice)      Increasing Adequacy →→→									
Tug Configuration and Reserve Capacity						1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)															
NA															

Overall Difficulty of Maneuver for Tested Conditions															
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult								
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions															
Run Difficulty						(Circle Choice)      Increasing Difficulty →→→									
Overall Difficulty						1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions															
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe								
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.														
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.														
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.														
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions														
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions														
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe								
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.															
Run Safety						(Circle Choice)      Increasing Safety →→→									
Overall Safety						1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety															
Inbound - Met outbound #1. Much more ship interaction. Outbound #2 - less interaction - steering 282° - stayed straight.															

Norfolk  
Pilot Run Evaluation  
October and November 2018

✓

Pilot: <u>JAMISON</u>	Run No.: <u>16</u>	Date: <u>10/16/18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<u>Container Kalina Norfolk A - Draft 14.9 m / 49 ft</u> <u>OUTBOUND</u> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 25 kt</u>	
Current Direction/ Speed (kt):	<u>Max flood</u> <u>Max ebb</u>	
Swell: Dir. From/Height		Seas: Dir. From/Height <u>N 1M</u>
Visibility:	<u>Day - Clear</u>	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>CBBT TO "ITS"</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>3-4° LEEWAY DUE TO WIND</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>YES</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy→→→→					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
N/A										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty→→→→					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety→→→→					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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Pilot Run Evaluation  
October and November 2018

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Pilot: <b>KEITH HOPE</b>	Run No.: <b>16</b>	Date: <b>10/16/18</b>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container <b>Kalina</b> Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded
	<b>INBOUND</b>	<input type="checkbox"/> Ballast

<b>Wind Direction / Speed (kt):</b>	<b>N 25kts</b>
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<b>Current Direction/ Speed (kt):</b>	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb
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<b>Swell: Dir. From/Height</b>	<b>1 meter</b>	<b>Seas:</b>	<b>Dir. From/Height</b>
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<b>Visibility:</b>	Day – <input checked="" type="checkbox"/> Clear
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<b>Assist Tugs Bollard Pulls:</b>	<b>NA</b>
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<b>Transit To / From:</b>	<b>INBOUND 1-5</b>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

Yes

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

7-8° leeway

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

Yes

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

No Wind was stronger.

5. Did you maintain an acceptable distance from the shoals?

Yes

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

No

**Norfolk**  
**Pilot Run Evaluation**  
**October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy →→→				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
NA										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty →→→				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety →→→				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
<p style="font-size: 1.2em;">INBOUND #1 13 kts. - steering 298° to make good 291° to get on stbd. side of channel. Approaching outbound steering 282° making 286° T. Much less ship interaction.</p>										

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Pilot Run Evaluation  
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Pilot: <u>KETH Hope</u>	Run No.: <u>17</u>	Date: <u>10/16/18</u>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container <u>Kalina</u> Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded
	<u>INBOUND</u>	<input type="checkbox"/> Ballast

Wind Direction / Speed (kt):	<u>N 25 kts</u>
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Current Direction/ Speed (kt):	Max flood <input checked="" type="checkbox"/> Max ebb	
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Swell: Dir. From/Height	<u>1 meter</u>	Seas: Dir. From/Height
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Visibility:	<u>Day - Clear</u>
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Assist Tugs Bollard Pulls:	<u>NA</u>
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Transit To / From:	<u>INBOUND - 1-5</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

Yes

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

3

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

Yes

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

Yes

5. Did you maintain an acceptable distance from the shoals?

Yes

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

No

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
NA										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
INBOUND #1 - Rudder jumped a little but did not affect navigation Met outbound at 10.5 kts. 200' rt. of center- interaction between vessels was good.										

Norfolk  
Pilot Run Evaluation  
October and November 2018

✓

Pilot: <u>JAMISON</u>	Run No.: <u>17</u>	Date: <u>10/10/18</u>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	<u>Container Kalina_Norfolk A- Draft 14.9 m / 49 ft</u> <u>27500D</u> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	<u>N 25 KTS</u>
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Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb
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Swell: Dir. From/Height	Seas:	Dir. From/Height <u>N/IM</u>
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Visibility:	<u>Day - Clear</u>
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Assist Tugs Bollard Pulls:	
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Transit To / From:	<u>CBBT TO "1" TS</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

3° - 4° LEEWAY FOR WIND

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

YES

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain an acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

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Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions											
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.											
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10	
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)											
N / A											

Overall Difficulty of Maneuver for Tested Conditions											
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions											
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10	

Overall Safety of Run for Tested Conditions											
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe				
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.										
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.										
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.										
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions										
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions										
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe				
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.											
Run Safety	(Circle Choice)					Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10	
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety											

Norfolk  
Pilot Run Evaluation  
October and November 2018

✓

Pilot: <u>JAMISON</u>	Run No.: <u>18</u>	Date: <u>10/16/18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<del>Container Kalina_Norfolk A- Draft 14.9 m / 49 ft</del> <u>INBOUND</u> <del>Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft</del> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 2SKTS</u>	
Current Direction/ Speed (kt):	<input type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb	
Swell: Dir. From/Height		Seas: Dir. From/Height
Visibility:	<u>Day - Clear</u>	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>VTS TO CBRT</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>3° - 6° LEEWAY FROM WIND</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>YES</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

**Norfolk  
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Tug Adequacy Rating for Tested Conditions											
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.											
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →										
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10	
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)											
N/A											

Overall Difficulty of Maneuver for Tested Conditions											
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions											
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →										
Overall Difficulty	1	2	3	4	5	6	7	8	9	10	

Overall Safety of Run for Tested Conditions											
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe				
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.										
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.										
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.										
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions										
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions										
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe				
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.											
Run Safety	(Circle Choice)      Increasing Safety → → →										
Overall Safety	1	2	3	4	5	6	7	8	9	10	
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety											

**Norfolk**  
**Pilot Run Evaluation**  
**October and November 2018**

*JS*

Pilot: <u>Keith Hope</u>	Run No.: <u>18</u>	Date: <u>10/16/18</u>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container Kalina_Norfolk A- Draft 14.9 m / 49 ft Bulk <u>Zhong Xing Hai</u> - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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<b>Wind Direction / Speed (kt):</b>	<u>N 25kts</u>
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<b>Current Direction/ Speed (kt):</b>	Max flood <input checked="" type="checkbox"/> <u>Max ebb</u>
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<b>Swell: Dir. From/Height</b>	<u>1 meter</u>	<b>Seas:</b>	<b>Dir. From/Height</b>
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<b>Visibility:</b>	Day - <input checked="" type="checkbox"/> Clear
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<b>Assist Tugs Bollard Pulls:</b>	<u>NA</u>
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<b>Transit To / From:</b>	<u>OUT BOUND#1 Buoys 5-1</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

Yes

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

04

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

Yes

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

Yes

5. Did you maintain and acceptable distance from the shoals?

Yes

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

No

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy →→→					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
NA										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty →→→					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety →→→					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
OUTBOUND #1 - 04 leeway - never got speed w/ Ebb current. Dramatic effect of bow cushion and then suction. Started 260rt. finished 450rt. A lot of rudder. 7.7kts										

Norfolk  
Pilot Run Evaluation  
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Pilot: <u>KEITH Hope</u>	Run No.: <u>18</u>	Date: <u>10/16/18</u>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

Model:	Container <u>Kalina</u> Norfolk A- Draft 14.9 m / 49 ft Bulk <u>Zhong Xing Hai</u> - Draft 15.5 m / 50.9 ft Container MSC Oscar Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	<u>N 25</u>
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Current Direction/ Speed (kt):	Max flood <input checked="" type="checkbox"/> Max ebb
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Swell: Dir. From/Height	<u>1 meter</u>	Seas:	Dir. From/Height
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Visibility:	Day - <input checked="" type="checkbox"/> Clear <u>0</u>
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Assist Tugs Bollard Pulls:	
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Transit To / From:	<u>OUTBOUND #2 5-1</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

Yes

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

0°

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

Yes

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

NO I grossly underestimated effects.

5. Did you maintain an acceptable distance from the shoals?

Yes

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

Yes Meeting

Norfolk  
Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
NA										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
OUTBOUND # 2 - 01 leeway Anticipated cushion & suction - had to react early. Still dramatic. <div style="text-align: right; margin-top: 10px;">60 kts.</div>										

Norfolk  
Pilot Run Evaluation  
October and November 2018

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Pilot: JAMISON	Run No.: 19	Date: 10/16/18
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

<b>Model:</b>	Container Kalina_Norfolk A - Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	10 SOUTH
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Current Direction/ Speed (kt):	Max flood Max ebb
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Swell: Dir. From/Height	Seas: Dir. From/Height 1/2 N
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Visibility:	Day - Clear 1/2 MILE
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Assist Tugs Bollard Pulls:	
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Transit To / From:	"ITS TO CBRT"
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

3° leeway → somewhat due to positioning ship for MEETING

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

YES

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain an acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
N/A										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
SAFE, BUT MORE UNCOMFORTABLE DUE TO RESTRICTED VISIBILITY										

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Pilot Run Evaluation  
October and November 2018

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Pilot: <u>Keith Hope</u>	Run No.: <u>19</u>	Date: <u>10/16/18</u>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

Model:	Container <u>Kalina</u> Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	<u>S 10 kts</u>
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Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb
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Swell: Dir. From/Height	<u>1/2 meter S</u>	Seas:	Dir. From/Height
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Visibility:	Day – Clear <u>1/2 mile</u>
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Assist Tugs Bollard Pulls:	
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Transit To / From:	<u>Outbound 5-1 Thimble</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

Yes

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

0° 2

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

Yes

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

Yes

5. Did you maintain an acceptable distance from the shoals?

Yes

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

No

Norfolk  
Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average				10=Most Adequate		
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy →→→					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
NA										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit				10=Most Difficult		
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty →→→					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety				10=Very Safe		
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety				10=Most Safe		
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety →→→					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
OUTBOUND #1 - handled more responsively than bulker. Speed 9 kts. - closer to centerline at start 200'.										

**Norfolk**  
**Pilot Run Evaluation**  
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Pilot: <u>KEITH HOPE / JAMISON</u>	Run No.: <u>20</u>	Date: <u>10/16/18</u>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container Kalina_Norfolk A- Draft 14.9 m / 49 ft Bulk <u>Zhong Xing Hai</u> → Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast

<b>Wind Direction / Speed (kt):</b>	<u>N 25 kts</u>
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<b>Current Direction/ Speed (kt):</b>	<input checked="" type="checkbox"/> <u>Max flood</u> <input type="checkbox"/> Max ebb
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<b>Swell: Dir. From/Height</b>	<u>1 meter</u>	<b>Seas:</b>	<b>Dir. From/Height</b>
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<b>Visibility:</b>	Day - <input checked="" type="checkbox"/> <u>Clear</u>
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<b>Assist Tugs Bollard Pulls:</b>	<u>NA</u>
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<b>Transit To / From:</b>	
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, *why?*)

Yes

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

0°

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

Yes

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

Yes

5. Did you maintain an acceptable distance from the shoals?

Yes

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

No

**Norfolk  
Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions											
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.											
Tug Adequacy	(Circle Choice)      Increasing Adequacy →→→										
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10	
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)											
NA											

Overall Difficulty of Maneuver for Tested Conditions											
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions											
Run Difficulty	(Circle Choice)      Increasing Difficulty →→→										
Overall Difficulty	1	2	3	4	5	6	7	8	9	10	

Overall Safety of Run for Tested Conditions											
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe				
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.										
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.										
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.										
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions										
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions										
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe				
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.											
Run Safety	(Circle Choice)      Increasing Safety →→→										
Overall Safety	1	2	3	4	5	6	7	8	9	10	
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety											
OUTBOUND - LPT 6 - CBBT went 1X for course changes and 5X for strait Aways.											

**Norfolk  
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Pilot: <u>JAMISON</u>	Run No.: <u>21</u>	Date: <u>10/17/18</u>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	<del>Container Kalina_Norfolk A - Draft 14.9 m / 49 ft</del> <u>Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft</u> <u>OUTBOUND</u> <del>Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft</del>	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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<b>Wind Direction / Speed (kt):</b>	<u>N 25 KTS</u>
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<b>Current Direction/ Speed (kt):</b>	<u>Max flood</u> Max ebb
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<b>Swell: Dir. From/Height</b>	<b>Seas:</b>	<b>Dir. From/Height</b>
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<b>Visibility:</b>	<u>Day - Clear</u>
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<b>Assist Tugs Bollard Pulls:</b>	
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<b>Transit To / From:</b>	<u>PIER IX TO "IEP"</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

NO CURRENT

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

YES

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain an acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average				10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy →→→									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										
N/A										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit				10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty →→→									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety				10=Very Safe				
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety				10=Most Safe				
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety →→→									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Pilot: <u>Chisman</u>	Run No.: <u>65</u>	Date: <u>10-23-18</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A- Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>S 25</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1.5 mtr S</u>	Seas: Dir. From/Height
Visibility:	Day - Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>TSC Meeting Area 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>Yes</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>3° 9kts</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>Yes</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>Yes</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
Overall Difficulty	1	(2)	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
Overall Safety	1	2	3	4	5	6	7	8	(9)	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Pilot: <b>DAVID WARE</b>	Run No.: <b>65</b>	Date: <b>10/23/18</b>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
<b>Model:</b>	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
<b>Wind Direction / Speed (kt):</b>	<b>S 25 KT</b>	
<b>Current Direction/ Speed (kt):</b>	<div style="border: 1px solid black; border-radius: 50%; padding: 2px; display: inline-block;">Max flood</div> Max ebb	
<b>Swell: Dir. From/Height</b>	<b>S 1 m</b>	<b>Seas: Dir. From/Height</b>
<b>Visibility:</b>	Day – Clear	
<b>Assist Tugs Bollard Pulls:</b>		
<b>Transit To / From:</b>		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, <i>why?</i> )		
<b>YES</b>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<b>2 DEG</b>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<b>YES</b>		
5. Did you maintain and acceptable distance from the shoals?		
<b>YES</b>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average				10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy →→→									
<b>Tug Configuration and Reserve Capacity</b>	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit				10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty →→→									
<b>Overall Difficulty</b>	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety				10=Very Safe				
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety				10=Most Safe				
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety →→→									
<b>Overall Safety</b>	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

**Norfolk**  
**Pilot Run Evaluation**  
**October and November 2018**

✓

Pilot: <b>DAVID WARE</b>	Run No.: <b>66</b>	Date: <b>10/23/18</b>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast

<b>Wind Direction / Speed (kt):</b>	<b>S 25 KT</b>
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<b>Current Direction/ Speed (kt):</b>	Max flood <input checked="" type="checkbox"/> Max ebb
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<b>Swell: Dir. From/Height</b>	<b>S   M</b>	<b>Seas:</b>	<b>Dir. From/Height</b>
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<b>Visibility:</b>	Day – Clear
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<b>Assist Tugs Bollard Pulls:</b>	
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<b>Transit To / From:</b>	
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

2-6 DEG

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain and acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions														
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate							
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.														
Tug Adequacy					(Circle Choice)      Increasing Adequacy → → →									
<b>Tug Configuration and Reserve Capacity</b>					1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)														

Overall Difficulty of Maneuver for Tested Conditions														
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult							
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions														
Run Difficulty					(Circle Choice)      Increasing Difficulty → → →									
<b>Overall Difficulty</b>					1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions														
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe							
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.													
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.													
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.													
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions													
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions													
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe							
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.														
Run Safety					(Circle Choice)      Increasing Safety → → →									
<b>Overall Safety</b>					1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety														

Norfolk  
Pilot Run Evaluation  
October and November 2018

✓

Pilot: <u>Chisman</u>	Run No.: <u>66</u>	Date: <u>10-23-18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input checked="" type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>S-25</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1 mtr S</u>	Seas: Dir. From/Height
Visibility:	Day – Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>TSC meeting area 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>Yes</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>3-4° 9 kts</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>Yes</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>Yes</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

**Norfolk  
Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average				10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy →→→									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit				10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty →→→									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety				10=Very Safe				
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety				10=Most Safe				
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety →→→									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

✓

Pilot: DAVID WARE	Run No.: 67	Date: 10/23/18
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container Kalina_Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	N 25 KT	
Current Direction/ Speed (kt):	Max flood Max ebb	
Swell: Dir. From/Height	N 1 m	Seas: Dir. From/Height
Visibility:	Day - Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
YES		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
2-4 DEG.		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
YES		
5. Did you maintain and acceptable distance from the shoals?		
YES		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
NO		

**Norfolk  
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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										



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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average				10=Most Adequate		
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit				10=Most Difficult		
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety				10=Very Safe		
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety				10=Most Safe		
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

✓

Pilot: <span style="font-size: 1.5em;">DAVID WARE</span>	Run No.: <span style="font-size: 1.5em;">68</span>	Date: <span style="font-size: 1.5em;">10/23/18</span>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container Kalina_Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast

<b>Wind Direction / Speed (kt):</b>	<span style="font-size: 1.5em;">N 25 KT</span>
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<b>Current Direction/ Speed (kt):</b>	Max flood <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Max ebb</span>
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<b>Swell: Dir. From/Height</b>	<span style="font-size: 1.5em;">x 1 m</span>	<b>Seas:</b>	<b>Dir. From/Height</b>
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<b>Visibility:</b>	Day - Clear
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<b>Assist Tugs Bollard Pulls:</b>	
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<b>Transit To / From:</b>	
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, *why?*)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

2-3 DEG

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain and acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)			Increasing Adequacy → → →						
<b>Tug Configuration and Reserve Capacity</b>	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)			Increasing Difficulty → → →						
<b>Overall Difficulty</b>	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)			Increasing Safety → → →						
<b>Overall Safety</b>	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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✓

Pilot: <u>Chisman</u>	Run No.: <u>68</u>	Date: <u>10-23-18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input checked="" type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 25</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>N 1 mtr</u>	Seas: Dir. From/Height
Visibility:	Day – Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>Yes</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>3-4° 8 Kts</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>Yes</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>Yes</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>Yes</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>No</u>		

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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Pilot: <u>Chisman</u>	Run No.: <u>69</u>	Date: <u>10-23-18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina Norfolk A – Draft 14.9 m / 49 ft <input checked="" type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 25</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1 mtr N</u>	Seas: Dir. From/Height
Visibility:	Day – Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>Yes</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>1°-2° 8 kts</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>Yes</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>Yes</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>Yes</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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J

Pilot: <b>DAVID WARE</b>	Run No.: <b>69</b>	Date: <b>10/23/18</b>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<b>N 25 KT</b>	
Current Direction/ Speed (kt):	Max flood	Max ebb
Swell: Dir. From/Height	<b>N 1 m</b>	Seas: Dir. From/Height
Visibility:	Day – Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<b>YES</b>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<b>6-9 DEG 12-13 KTS NEEDED</b>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<b>YES</b>		
5. Did you maintain an acceptable distance from the shoals?		
<b>YES</b>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<b>NO</b>		

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy →→→									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty →→→									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety →→→									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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✓

Pilot: DAVID WARE	Run No.: 70	Date: 10/23/18
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	S 10 KT	
Current Direction/ Speed (kt):	Max flood Max ebb	
Swell: Dir. From/Height	1/2 m S	Seas: Dir. From/Height
Visibility:	Day – Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
YES		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
4-6 DEG      12-13 KT		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
YES		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
YES		
5. Did you maintain an acceptable distance from the shoals?		
YES		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
NO		

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy →→→									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty →→→									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety →→→									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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✓

Pilot: <u>Chrisman</u>	Run No.: <u>70</u>	Date: <u>10-23-18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A - Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>S 10</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>15 mtr S</u>	Seas: Dir. From/Height
Visibility: Day - Clear	<u>0.5 NM</u>	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>Yes</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>2° 10-11 Kts</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>Yes</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>Yes</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>No</u>		

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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Pilot: <u>Chisman</u>	Run No.: <u>71</u>	Date: <u>10-23-18</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	<u>Container Kalina_Norfolk A – Draft 14.9 m / 49 ft</u> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>S 20</u>	
Current Direction/ Speed (kt):	<input type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1 MTR South</u>	Seas: Dir. From/Height
Visibility:	Day – Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>Meeting area 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>Yes</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>30-40 9 KTS</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>Yes</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>Yes</u>		
5. Did you maintain and acceptable distance from the shoals?		
<u>Yes</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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✓

Pilot: DAVID WARE	Run No.: 71	Date: 10/23/18
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	S 25 KT	
Current Direction/ Speed (kt):	(Max flood) Max ebb	
Swell: Dir. From/Height		Seas: Dir. From/Height
Visibility:	Day – Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
YES		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
2 DEG      10 KT		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
YES		
5. Did you maintain an acceptable distance from the shoals?		
YES		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
NO		

**Norfolk  
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Tug Adequacy Rating for Tested Conditions												
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate					
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.												
Tug Adequacy			(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity			1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)												

Overall Difficulty of Maneuver for Tested Conditions												
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult					
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions												
Run Difficulty			(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty			1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions												
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe					
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.											
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.											
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.											
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions											
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions											
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe					
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.												
Run Safety			(Circle Choice)			Increasing Safety → → →						
Overall Safety			1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety												

Norfolk  
Pilot Run Evaluation  
October and November 2018

✓

Pilot: <b>Chisman</b>	Run No.: <b>72</b>	Date: <b>10-23-18</b>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast

<b>Wind Direction / Speed (kt):</b>	<b>S 25</b>
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<b>Current Direction/ Speed (kt):</b>	Max flood <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Max ebb</span>
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<b>Swell: Dir. From/Height</b>	<b>S 1 mtr</b>	<b>Seas:</b>	<b>Dir. From/Height</b>
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<b>Visibility:</b>	Day – Clear
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<b>Assist Tugs Bollard Pulls:</b>	
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<b>Transit To / From:</b>	
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, *why?*)

Yes

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

30-40 8-9 kts

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

Yes

5. Did you maintain an acceptable distance from the shoals?

Yes

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

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Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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Pilot: DAVID WARE	Run No.: 72	Date: 10/23/18
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	S 25 kt	
Current Direction/ Speed (kt):	Max flood <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Max ebb</span>	
Swell: Dir. From/Height	S 1 m	Seas: Dir. From/Height
Visibility:	Day – Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<del>NO</del> - <del>NO</del> YES		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
2-4 DEG      11-12 KT		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
YES		
5. Did you maintain an acceptable distance from the shoals?		
YES		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
NO		

**Norfolk  
Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

JL

Pilot: <u>Chisman</u>	Run No.: <u>73</u>	Date: <u>10-23-18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container Kalina_Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 25</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1 mtr N</u>	Seas: Dir. From/Height
Visibility:	<u>Day - Clear</u>	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>Meeting area 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>Yes</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>3°-4° 11 KTS</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>Yes</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>Yes</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>Yes... I would have asked inbound 2 to get closer to the Starboard side of her Channel</u>		

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Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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Pilot Run Evaluation  
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✓

Pilot: DAVID WARE	Run No.: 73	Date: 10/23/18
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container Kalina_Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	N 25 KT	
Current Direction/ Speed (kt):	Max flood Max ebb	
Swell: Dir. From/Height	1 m	Seas: Dir. From/Height
Visibility:	Day - Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
YES		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
5-7 DEG 12 KTS		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
YES		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
YES		
5. Did you maintain an acceptable distance from the shoals?		
YES		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
No		

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy →→→									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty →→→									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety →→→									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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Pilot: DAVID WARE	Run No.: 74	Date: 10/23/18
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	N 25 KT	
Current Direction/ Speed (kt):	Max flood Max ebb	
Swell: Dir. From/Height	1 m N	Seas: Dir. From/Height
Visibility:	Day – Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
YES		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
3-4 DEG      11-12 ICT		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
/		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
YES		
5. Did you maintain an acceptable distance from the shoals?		
YES		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
NO		

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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✓

Pilot: <u>Chisman</u>	Run No.: <u>74</u>	Date: <u>10-23-18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A - Draft 14.9 m / 49 ft <input checked="" type="checkbox"/> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 25</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1 mtr N</u>	Seas: Dir. From/Height
Visibility:	<u>Day - Clear</u>	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>Meeting area 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>Yes</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>2-3° 9-10 Kts</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>Yes</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>Yes</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
<b>Tug Configuration and Reserve Capacity</b>	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
<b>Overall Difficulty</b>	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
<b>Overall Safety</b>	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

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Pilot: DAVID WARE	Run No.: 75	Date: 10/23/18
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container Kalina_Norfolk A- Draft 14.9 m / 49 ft Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	N 25 KT	
Current Direction/ Speed (kt):	Max flood Max ebb	
Swell: Dir. From/Height	N 1 M	Seas: Dir. From/Height
Visibility:	Day - Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
YES		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
2 DEG		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
FOR THE MOST PART, SEEMED TO RECOVER TOO QUICKLY FROM SHIP INTERACTION		
5. Did you maintain an acceptable distance from the shoals?		
YES		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
NO		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)			Increasing Safety → → →						
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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October and November 2018

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Pilot: <u>Chrisman</u>	Run No.: <u>75</u>	Date: <u>10-23-18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A- Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 25</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1 mtr N</u>	Seas: Dir. From/Height
Visibility:	Day - Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>Meeting Area 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>Yes</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>4°-5° 12 Kts - Stronger set than other simulations</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>Yes</u>		
5. Did you maintain and acceptable distance from the shoals?		
<u>Yes</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>Yes. Too close to first outbound bulker. Should have been closer to starboard side of channel</u>		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

✓

Pilot: <u>Chisman</u>	Run No.: <u>76</u>	Date: <u>10-23-18</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>S 10</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>5 mtr S</u>	Seas: Dir. From/Height
Visibility:	Day – Clear <u>0.5 nm</u>	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>Yes</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>3° 11-12 kts</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>Yes</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>Yes</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
<b>Tug Configuration and Reserve Capacity</b>	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
<b>Overall Difficulty</b>	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
<b>Overall Safety</b>	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

✓

Pilot: <span style="font-size: 1.5em;">DAVID WARE</span>	Run No.: <span style="font-size: 1.5em;">76</span>	Date: <span style="font-size: 1.5em;">10/23/18</span>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast

**Wind Direction / Speed (kt):** S 10 KT

**Current Direction/ Speed (kt):** 
 Max flood  
 Max ebb

<b>Swell: Dir. From/Height</b>	<span style="font-size: 1.5em;">S 1/2 m</span>	<b>Seas:</b>	<b>Dir. From/Height</b>
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**Visibility:** Day – Clear

**Assist Tugs Bollard Pulls:**

**Transit To / From:**

1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

1-2 DEG , 10 KT

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain and acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)			Increasing Adequacy → → →						
<b>Tug Configuration and Reserve Capacity</b>	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)			Increasing Difficulty → → →						
<b>Overall Difficulty</b>	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)			Increasing Safety → → →						
<b>Overall Safety</b>	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Pilot: <b>DAVID WARE</b>	Run No.: <b>83</b>	Date: <b>10/24/18</b>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<b>NE 25 KT</b>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<b>NE 1 m</b>	Seas: Dir. From/Height
Visibility:	<b>Day – Clear</b>	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<b>YES</b>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<b>2 - 6 DEG</b>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<b>YES</b>		
5. Did you maintain an acceptable distance from the shoals?		
<b>YES</b>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<b>NO</b>		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
<b>Tug Configuration and Reserve Capacity</b>				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
<b>Overall Difficulty</b>				1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions													
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe						
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.												
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.												
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.												
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions												
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions												
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe						
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
<b>Overall Safety</b>				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Pilot: <u>Chisman</u>	Run No.: <u>84</u>	Date: <u>10/24/18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>SW 25</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>SW 1mtr</u>	Seas: Dir. From/Height
Visibility:	<u>Day – Clear</u>	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>Yes.</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>4° in Thimble 9 kts 6° in NTR 7.5 kts 8-10° in Craney Island reach 5-6.5 kts</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>I think the leeway in NTR and CIR was excessive.</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>Yes</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>No</u>		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty				1	2	(3)	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions													
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe						
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.												
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.												
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.												
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions												
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions												
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe						
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
Overall Safety				1	2	3	4	5	6	7	(8)	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Pilot: <b>DAVID WARE</b>	Run No.: <b>85</b>	Date: <b>10/24/18</b>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

<b>Model:</b>	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast

<b>Wind Direction / Speed (kt):</b>	<b>NE 25 KT</b>		
<b>Current Direction/ Speed (kt):</b>	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb		
<b>Swell: Dir. From/Height</b>		<b>Seas:</b>	<b>Dir. From/Height</b>

<b>Visibility:</b>	Day – Clear
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<b>Assist Tugs Bollard Pulls:</b>	
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<b>Transit To / From:</b>	
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

STARTING - 7-8° / ONCE UP TO SPEED 2° w/ 10 KTS

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

YES

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain and acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy →→→						
<b>Tug Configuration and Reserve Capacity</b>				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty →→→						
<b>Overall Difficulty</b>				1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions													
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe						
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.												
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.												
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.												
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions												
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions												
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe						
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety →→→						
<b>Overall Safety</b>				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Pilot: <u>Chisman</u>	Run No.: <u>86</u>	Date: <u>10-24-18</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A- Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>SW 25</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1 mtr S</u>	Seas: Dir. From/Height
Visibility:	Day - Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>Yes</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>5° 8 kts</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>Yes</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>Yes</u>		
5. Did you maintain and acceptable distance from the shoals?		
<u>Yes</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>No</u>		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													

Overall <i>Difficulty</i> of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty				1	2	3	4	5	6	7	8	9	10

Overall <i>Safety</i> of Run for Tested Conditions													
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe						
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.												
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.												
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.												
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions												
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions												
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe						
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
Overall Safety				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Pilot: <u>DAVID WARE</u>	Run No.: <u>807</u>	Date: <u>10/24/18</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input checked="" type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 25 KT</u>	
Current Direction/ Speed (kt):	<u>Max flood</u> Max ebb	
Swell: Dir. From/Height	Seas:	Dir. From/Height
Visibility:	<u>Day – Clear</u>	
Assist Tugs Bollard Pulls:		
Transit To / From:		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>1-2° DEG</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES, SQUATED TOO MUCH AT LOW SPEED</u>		
5. Did you maintain and acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall <i>Difficulty</i> of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall <i>Safety</i> of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Pilot: <b>DAVID WARE</b>	Run No.: <b>88</b>	Date: <b>10/24/18</b>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
<b>Model:</b>	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
<b>Wind Direction / Speed (kt):</b>	<b>N 25 KT</b>	
<b>Current Direction/ Speed (kt):</b>	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
<b>Swell: Dir. From/Height</b>		<b>Seas: Dir. From/Height</b>
<b>Visibility:</b>	Day – Clear	
<b>Assist Tugs Bollard Pulls:</b>		
<b>Transit To / From:</b>		
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<b>YES</b>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<b>1-2 DEG - 6-7 KT</b>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<b>YES</b>		
5. Did you maintain and acceptable distance from the shoals?		
<b>YES</b>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<b>NO</b>		

**Norfolk**  
**Pilot Run Evaluation**  
**October and November 2018**

Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													

Overall <i>Difficulty</i> of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty				1	2	3	4	5	6	7	8	9	10

Overall <i>Safety</i> of Run for Tested Conditions													
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe						
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.												
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.												
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.												
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions												
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions												
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe						
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
Overall Safety				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Pilot: <u>JACOB JOHNSON</u>	Run No.: <u>119</u>	Date: <u>11/5/18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>NE 25 KTS</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1 FOOT</u>	Seas: Dir. From/Height
Visibility:	Day <input checked="" type="checkbox"/> Clear	
Assist Tugs Bollard Pulls:	<u>N/A</u>	
Transit To / From:	<u>CAPE HENRY TO CRANEY ISLAND</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>THE TRANSIT WAS MADE SUCCESSFULLY. THE DRIFT ANGLE WAS AS MUCH AS 7° AT CAPE HENRY AND CAME DOWN TO 2°/3° AS WE PROCEEDED IN BOUND</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>AVERAGE DRIFT ANGLE WAS 3°</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>N/A</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>THE SHIP HANDLED VERY MUCH THE SAME AS WHAT WE HAVE EXPERIENCED IN THE MOVEMENTS OF ACTUAL SHIPS OF THIS SIZE</u>		
5. Did you maintain and acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO. RUN WENT AS EXPECTED WITH THE WEC AND ENVIRONMENTAL CONDITIONS.</u>		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
<b>Tug Configuration and Reserve Capacity</b>	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
<b>Overall Difficulty</b>	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
<b>Overall Safety</b>	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										



**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty				1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions													
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe						
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.												
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.												
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.												
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions												
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions												
Safety Rating Scale													
1=Unsafe			5=Average Safety			10=Most Safe							
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
Overall Safety				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>JACOB JOHNSON</u>	Run No.: <u>121</u>	Date: <u>11/5/18</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>NE 30</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1 m</u>	Seas: Dir. From/Height
Visibility:	Day <input checked="" type="checkbox"/> Clear	
Assist Tugs Bollard Pulls:	<u>N/A</u>	
Transit To / From:	<u>VIA TO CBBT</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES. THE DRIFT ANGLE IN CRANEY ISLAND AND NORFOLK HARBOUR SEEMED EXCESSIVE, OTHERWISE IT WAS APPROPRIATE. THE ANGLE ALLOWED FOR ONLY 1 WAY TRANSIT DUE TO INCREASED BEAM</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>6° DRIFT 8 KNOTS SOG</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>N/A</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES. SEVERAL TIMES IT SEEMED RELUCTANT TO TURN INTO THE WIND EVEN AFTER COUNTER RUDDER WAS NEEDED</u>		
5. Did you maintain an acceptable distance from the shoals? <u>TO MAINTAIN HEADING</u>		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO NOT WITH ONE WAY TRAFFIC</u>		

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>E. WRIGHTSTILL ANERY</u>	Run No.: <u>122</u>	Date: <u>11/5/2018</u>
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A- Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	<u>SW 25 kts</u>
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Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb
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Swell: Dir. From/Height	<u>1 m from SW</u>	Seas:	Dir. From/Height
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Visibility:	<u>Day - Clear</u>
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Assist Tugs Bollard Pulls:	<u>N/A</u>
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Transit To / From:	<u>VIG to CBRT</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES. USED CENTERLINE OF CHANNEL

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

3-4 degrees leeway

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

N/A

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES. MODEL ACTED AS ONE WOULD EXPECT IN REAL TIME

5. Did you maintain an acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO - ONE WAY TRAFFIC ALLOWED USE OF CENTERLINE

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Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty				1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			

10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
Overall Safety				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>JACOB JOHNSON</u>	Run No.: <u>123</u>	Date: <u>11/5/18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input checked="" type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 30</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>N/1m</u>	Seas: Dir. From/Height
Visibility:	Day <input checked="" type="checkbox"/> Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>CRANEY ISLAND (LPCT) TO CBBT</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES. THE SHIP HANDLED VERY WELL AND HAD A MEASURABLE DRIFT ANGLE</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>1°-2°</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>N/A</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES. REACTED VERY WELL TO CONDITIONS</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

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Tug Adequacy Rating for Tested Conditions												
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate					
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.												
Tug Adequacy			(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity			1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)												

Overall Difficulty of Maneuver for Tested Conditions												
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult					
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions												
Run Difficulty			(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty			1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions												
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe					
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.											
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.											
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.											
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions											
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions											
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe					
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.												
Run Safety			(Circle Choice)			Increasing Safety → → →						
Overall Safety			1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety												

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>E. WAIGHTSILL AVERY</u>	Run No.: <u>124</u>	Date: <u>11/5/2018</u>
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

Model:	<u>Container Kalina_Norfolk A- Draft 14.9 m / 49 ft</u> <u>Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft</u> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	<u>N 25 kts</u>
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Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb
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Swell: Dir. From/Height	<u>1 m from N</u>	Seas:	Dir. From/Height
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Visibility:	Day - Clear
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Assist Tugs Bollard Pulls:	<u>N/A</u>
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Transit To / From:	<u>NNMT TO HRBT</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)  
YES
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?  
YES
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?  
N/A
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?  
YES. MODEL ACTED AS ONE WOULD IN REAL TIME
5. Did you maintain and acceptable distance from the shoals?  
YES
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?  
NO

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>E. WRIGHTSFELL AVERY</u>	Run No.: <u>125</u>	Date: <u>11/6/2018</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>S 25 Kts</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1 m from S</u>	Seas: Dir. From/Height
Visibility:	Day – Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>MEETING AREA 2 OUTBOUND</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>INITIALLY IT WAS 7 degrees then settled in @ 2-3 degrees</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>N/A</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty				1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									

Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe						
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
Overall Safety				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

Norfolk  
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Pilot: <u>JACOB JOHNSON</u>	Run No.: <u>125</u>	Date: <u>11/6/18</u>
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	<u>SW 25</u>
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Current Direction/ Speed (kt):	<u>Max flood</u>		
	<u>Max ebb</u>		

Swell: Dir. From/Height	<u>1m</u>	Seas:	Dir. From/Height
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Visibility:	<u>Day - Clear</u>
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Assist Tugs Bollard Pulls:	
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Transit To / From:	<u>CAPE HENRY → MEETING AREA Z</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

4-5° TO MAKE THE TRANSIT @ 10KTS

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain an acceptable distance from the shoals?

YES. DID ALLOW THE SHIP TO GET A LITTLE TOO FAR TO THE RIGHT BUT WAS ABLE TO RECOVER

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

WOULD KEEP THE SHIP 325' 350' RIGHT OF CENTER TO AVOID BANK EFFECT OFF STBD SIDE

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Tug Adequacy Rating for Tested Conditions												
Tug Adequacy Rating	1= Inadequate			5=Average				10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.												
Tug Adequacy			(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity			1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)												

Overall Difficulty of Maneuver for Tested Conditions												
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit				10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions												
Run Difficulty			(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty			1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions												
Explanation of Scale	1=Unsafe			5=Average Safety				10=Very Safe				
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.											
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.											
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.											
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions											
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions											
Safety Rating Scale	1=Unsafe			5=Average Safety				10=Most Safe				
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.												
Run Safety			(Circle Choice)				Increasing Safety → → →					
Overall Safety			1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety												
<p style="font-size: 2em; color: blue; margin: 0;">FEE</p>												



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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy →→→					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty →→→					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety →→→					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

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Pilot Run Evaluation  
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Pilot: <u>JACOB JOHNSON</u>	Run No.: <u>126</u>	Date: <u>11/6/18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>S 25</u>	
Current Direction/ Speed (kt):	Max flood <input checked="" type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>S 1m</u>	Seas: Dir. From/Height
Visibility:	Day – <input checked="" type="checkbox"/> Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>CAPE HENRY → MEETING AREA Z</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>CAPE</u> <u>YES. TRANSIT WAS VERY SMOOTH STAYING 350'-375'</u> <u>RIGHT OF CENTERLINE</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>4° @ 9 kts</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES 350'-375' RIGHT OF CENTER LINES</u> <u>SUFFICIENT ROOM FROM BANK FOR SAFE RUN</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

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Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average				10=Most Adequate					
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit				10=Most Difficult					
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty				1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions													
Explanation of Scale	1=Unsafe			5=Average Safety				10=Very Safe					
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.												
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.												
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.												
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions												
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions												
Safety Rating Scale	1=Unsafe			5=Average Safety				10=Most Safe					
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
Overall Safety				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

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Pilot Run Evaluation  
October and November 2018

Pilot: <u>E. WAIGHTSTILL AVERY</u>	Run No.: <u>127</u>	Date: <u>11/6/2018</u>
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	<u>N 25kts</u>
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Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb
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Swell: Dir. From/Height	<u>1 m N</u>	Seas:	Dir. From/Height
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Visibility:	Day – Clear
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Assist Tugs Bollard Pulls:	
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Transit To / From:	<u>INBOUND / TS-CBBT (MEETING AREA 2)</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

TO GET OVER TO MY SIDE OF CHANNEL I USED 14 degrees OF leeway, then settled in at 3-5 degrees

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

~~YES~~ N/A

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain an acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy →→→					
<b>Tug Configuration and Reserve Capacity</b>	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty →→→					
<b>Overall Difficulty</b>	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety →→→					
<b>Overall Safety</b>	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>JACOB JOHNSON</u>	Run No.: <u>127</u>	Date: <u>11/6/18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 25</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>N 1m</u>	Seas: Dir. From/Height
Visibility:	Day – <input checked="" type="checkbox"/> Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>CRBT → MEETING AREA 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES. ABLE TO STAY 350' OFF CENTERLINE PROVIDING GOOD ROOM FROM SHOAL WATER</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>4° @ 9 KTS</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>YES</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain and acceptable distance from the shoals?		
<u>YES 350' RIGHT OF CENTERLINE GAVE GOOD ROOM ON SHOAL</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average				10=Most Adequate		
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit				10=Most Difficult		
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety				10=Very Safe		
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety				10=Most Safe		
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>JACOB JOHNSON</u>	Run No.: <u>128</u>	Date: <u>11/6/18</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 25</u>	
Current Direction/ Speed (kt):	<input type="checkbox"/> Max flood <input checked="" type="checkbox"/> <u>Max ebb</u>	
Swell: Dir. From/Height	<u>N 1m</u>	Seas: Dir. From/Height
Visibility:	Day – <input checked="" type="checkbox"/> Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>CBBT → MEETING AREA Z</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES. ABLE TO KEEP 350' OFF CENTERLINE ALLOWS FOR SAFE MEETING AND GOOD SHIP RESPONSE</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>3° @ 1 KTS</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES 350' ALLOWS SAFE DISTANCE FROM SHOAL</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

**Norfolk**  
**Pilot Run Evaluation**  
**October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy →→→									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty →→→									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety →→→									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>E. WAIGHTSTILL AVERY</u>	Run No.: <u>128</u>	Date: <u>11/6/2018</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	<u>Container Kalina_Norfolk A - Draft 14.9 m / 49 ft</u>	<input type="checkbox"/> Loaded
	Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 25kts</u>	
Current Direction/ Speed (kt):	<u>Max flood</u> <u>Max ebb</u>	
Swell: Dir. From/Height	<u>1m N</u>	Seas: Dir. From/Height
Visibility:	Day - Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>INBOUND ITS to CBT (MEETING AREA 2)</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>YES 4degrees leeway with the FBB CURRENT</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>N/A</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty				1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									

Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe						
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
Overall Safety				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>E. WRIGHTSTILL AVERY</u>	Run No.: <u>129</u>	Date: <u>11/6/2018</u>
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

Model:	<u>Container Kalina_Norfolk A - Draft 14.9 m / 49 ft</u> <u>Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft</u> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast

Wind Direction / Speed (kt):	<u>N 25 kts</u>
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Current Direction/ Speed (kt):	<u>Max flood</u> Max ebb
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Swell: Dir. From/Height	<u>1 m N</u>	Seas:	Dir. From/Height
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Visibility:	Day - Clear
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Assist Tugs Bollard Pulls:	
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Transit To / From:	<u>OUTBOUND CBBT - ITS (MEETING AREA 2)</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

2-4 degrees at first the 2-3 degrees to hold

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

N/A

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain an acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty				1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									

Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe						
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
Overall Safety				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>JACOB JOHNSON</u>	Run No.: <u>129</u>	Date: <u>11/6/18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 25</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>N 1m</u>	Seas: Dir. From/Height
Visibility:	Day – <input checked="" type="checkbox"/> Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>CAPE HERRY → MEETING AREA 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES. HAD TO DRIVE SHIP UP INTO CURRENT AND WIND BUT ABLE TO DO SO IN TIME AND MAINTAIN 350° DRIFT</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>4°-6° ONCE STEADY TO MAINTAIN 288° TOOK MORE TO MOVE OVER IN CHANNEL → 11 KTS</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>YES</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

**Norfolk  
Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average				10=Most Adequate		
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy →→→									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit				10=Most Difficult		
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty →→→									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety				10=Very Safe		
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety				10=Most Safe		
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety →→→									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>E. WAIGUTSTILL ALEAY</u>	Run No.: <u>130</u>	Date: <u>11/6/2018</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	Container Kalina_Norfolk A – Draft 14.9 m / 49 ft Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>S 10kts</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1m S</u>	Seas: Dir. From/Height
Visibility:	<input checked="" type="checkbox"/> Day – Clear <u>FOG</u>	
Assist Tugs Bollard Pulls:	<u>N/A</u>	
Transit To / From:	<u>OUTBOUND CBBT – ITS (PASSING AREA 2)</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>only a couple of degrees</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>N/A</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
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Pilot: <u>JOHNSON JACOB</u>	Run No.: <u>130</u>	Date: <u>11/6/18</u>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	<u>S 10</u>		
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb		
Swell: Dir. From/Height	<u>1m S</u>	Seas:	Dir. From/Height
Visibility:	Day – Clear <u>FOG</u>		

Assist Tugs Bollard Pulls:	
Transit To / From:	<u>CAPE HENRY → MEETING AREA Z</u>

1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES. DRIFT ANGLE WAS SMALL DUE TO LIGHT WIND

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

2° 11.5 kts

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain an acceptable distance from the shoals?

I ALLOWED MYSELF TO GET 415' RIGHT OF CENTER WHEN I MET FIRST OUTBOUND. FELT THE SHOAL AND SHEARED. WAS ABLE TO CATCH THE SWING BUT WAS CLOSER TO SECOND SHIP THAN I WOULD HAVE LIKED

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

YES. WOULD HAVE MAINTAINED 350' RIGHT OF CENTER SO AS TO AVOID INTERACTION WITH THE BANK

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Pilot Run Evaluation  
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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										
<p style="font-size: 1.2em; color: blue;">FOA ADDED DIFFERENT <del>ASPECT</del> ASPECT BUT STILL SAFE</p>										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>JACOB JOHNSON</u>	Run No.: <u>131</u>	Date: <u>11/6/18</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>S 25</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>S 1m</u>	Seas: Dir. From/Height
Visibility:	Day <input checked="" type="checkbox"/> Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>CBBT → MEETING AREA 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES. ABLE TO MAINTAIN SAFE DRIFT ANGLE TO KEEP BOTH OUTBOUNDS SAFELY 350' RIGHT OF CENTER</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>4° @ 10KTS</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>YES</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions												
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate					
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.												
Tug Adequacy			(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity			1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)												

Overall Difficulty of Maneuver for Tested Conditions												
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult					
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions												
Run Difficulty			(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty			1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions												
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe					
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.											
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.											
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.											
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions											
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions											
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe					
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.												
Run Safety			(Circle Choice)			Increasing Safety → → →						
Overall Safety			1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety												

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>E. WAIGRISTILL AWEAY</u>	Run No.: <u>131</u>	Date: <u>11/6/2018</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>S 25 kts</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1 m S</u>	Seas: Dir. From/Height
Visibility:	<input checked="" type="checkbox"/> Day – Clear	
Assist Tugs Bollard Pulls:	<u>N/A</u>	
Transit To / From:	<u>INBOUND PASSING AREA 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>2-3 degrees</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>N/A</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average				10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice) <span style="font-size: 1.2em;">→→→</span> Increasing Adequacy									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit				10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice) <span style="font-size: 1.2em;">→→→</span> Increasing Difficulty									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety				10=Very Safe				
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety				10=Most Safe				
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice) <span style="font-size: 1.2em;">→→→</span> Increasing Safety									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>E. WRIGHTSILL AVERY</u>	Run No.: <u>132</u>	Date: <u>11/6/2018</u>
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	<u>S 25 kts</u>
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Current Direction/ Speed (kt):	<input type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb
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Swell: Dir. From/Height	<u>1 m S</u>	Seas:	Dir. From/Height
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Visibility:	<input checked="" type="checkbox"/> Day – Clear
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Assist Tugs Bollard Pulls:	<u>N/A</u>
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Transit To / From:	<u>INBOUND PASSING AREA 2</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

3 degrees

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

N/A

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain an acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)					Increasing Adequacy → → →				
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)					Increasing Difficulty → → →				
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)					Increasing Safety → → →				
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>JACOB JOHNSON</u>	Run No.: <u>132</u>	Date: <u>11/6/18</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>S 25 kts</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>S 1m</u>	Seas: Dir. From/Height
Visibility:	Day <input checked="" type="checkbox"/> Clear	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>CBBT TO CAPE HENRY → MEETING AREA Z</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES. DRIFT ANGLE WAS SAFE AND ABLE TO MAINTAIN 350' RIGHT</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>4° @ 13 kts</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO EXCEPT WOULD PROBABLY SLOW FOR MEETING OTHER VESSEL</u>		

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>F. WRIGHTSTILL AVERY</u>	Run No.: <u>133</u>	Date: <u>11/6/2018</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A- Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai - Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A - Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 25 Kts</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1 m N</u>	Seas: Dir. From/Height
Visibility:	<input checked="" type="checkbox"/> Day - Clear	
Assist Tugs Bollard Pulls:	<u>N/A</u>	
Transit To / From:	<u>OUTBOUND PASSING AREA 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>3 degrees</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>N/A</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

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Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average				10=Most Adequate				
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice) <span style="float: right;">Increasing Adequacy →→→</span>									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit				10=Most Difficult				
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice) <span style="float: right;">Increasing Difficulty →→→</span>									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions			
Explanation of Scale	1=Unsafe	5=Average Safety	10=Very Safe
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.		
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.		
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.		
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions		
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions		
Safety Rating Scale	1=Unsafe	5=Average Safety	10=Most Safe

10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice) <span style="float: right;">Increasing Safety →→→</span>									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>Jacob Johnson</u>	Run No.: <u>133</u>	Date: <u>11/6/18</u>
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast

Wind Direction / Speed (kt):	<u>N 25</u>
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Current Direction/ Speed (kt):	<u>Max flood</u>		
	<u>Max ebb</u>		

Swell: Dir. From/Height	<u>N 1m</u>	Seas:	Dir. From/Height
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Visibility:	<u>Day – Clear</u>
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Assist Tugs Bollard Pulls:	
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Transit To / From:	<u>CAPE HENRY → MEETING AREA Z</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES SHIPS SPEED WAS 14 KTS BUT ANCHORED WELL AND LITTLE TO NO INTERACTION B/W VESSELS OR BANK

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

30 14KTS

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

PROBABLY WOULDN'T HAVE MADE 14KTS STEADY AND WITHOUT INTERACTION

5. Did you maintain an acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

WOULD HAVE KEPT SPEED DOWN AROUND 10

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions												
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate					
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.												
Tug Adequacy			(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity			1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)												

Overall Difficulty of Maneuver for Tested Conditions												
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult					
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions												
Run Difficulty			(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty			1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions												
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe					
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.											
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.											
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.											
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions											
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions											
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe					
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.												
Run Safety			(Circle Choice)			Increasing Safety → → →						
Overall Safety			1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety												

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>E. WRIGHTS FILL AVERY</u>	Run No.: <u>134</u>	Date: <u>11/6/2018</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	<u>Container Kalina Norfolk A – Draft 14.9 m / 49 ft</u> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N 25kts</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1 m N</u>	Seas: Dir. From/Height
Visibility:	<u>Day – Clear</u>	
Assist Tugs Bollard Pulls:	<u>N/A</u>	
Transit To / From:	<u>OUTBOUND PASSING AREA 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>2-3 degrees</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>N/A</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

**Norfolk**  
**Pilot Run Evaluation**  
**October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>JACOB JOHNSON</u>	Run No.: <u>134</u>	Date: <u>11/6/18</u>
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Please Circle Conditions. Answer only questions that are applicable to the exercise.

Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	<u>N 25</u>
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Current Direction/ Speed (kt):	<input type="checkbox"/> Max flood <input checked="" type="checkbox"/> Max ebb	
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Swell: Dir. From/Height	<u>N 1m</u>	Seas:	Dir. From/Height
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Visibility:	Day <input checked="" type="checkbox"/> Clear
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Assist Tugs Bollard Pulls:	
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Transit To / From:	<u>CAPE HENRY → MEETING AREA 2</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES VERY SAFE TRANSIT WITH NO EXCESSIVE DRIFT

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

30° + 1 KTS

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

[Blank]

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain an acceptable distance from the shoals?

YES

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty				1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions											
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe				
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.										
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.										
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.										
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions										
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions										

Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe						
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
Overall Safety				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>E. WAIGHTSTICK AVERY</u>	Run No.: <u>135</u>	Date: <u>11/6/2018</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>N<sup>W</sup> 25 kts</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height	<u>1m N</u>	Seas: Dir. From/Height
Visibility:	<u>Day – Clear</u>	
Assist Tugs Bollard Pulls:	<u>N/A</u>	
Transit To / From:	<u>INBOUND PASSING AREA 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>3-4 degrees</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>N/A</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain and acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy →→→					
<b>Tug Configuration and Reserve Capacity</b>	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty →→→					
<b>Overall Difficulty</b>	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety →→→					
<b>Overall Safety</b>	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>JACOB JOHNSON</u>	Run No.: <u>135</u>	Date: <u>11/6/18</u>
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*Please Circle Conditions. Answer only questions that are applicable to the exercise.*

Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input checked="" type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input checked="" type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
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Wind Direction / Speed (kt):	<u>N 25</u>
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Current Direction/ Speed (kt):	<u>Max flood</u> <u>Max ebb</u>
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Swell: Dir. From/Height	<u>N 1 m</u>	Seas:	Dir. From/Height
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Visibility:	<u>Day – Clear</u>
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Assist Tugs Bollard Pulls:	
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Transit To / From:	<u><del>CAGE CBST</del> &gt; MEETING AREA 2</u>
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1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)

YES LITTLE TO NO DRIFT. ONLY TO ALLOW FOR THE CURRENT

2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?

2° 08 kts

3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?

4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?

YES

5. Did you maintain an acceptable distance from the shoals?

YES SHIP HANDLED WELL

6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?

NO

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)				Increasing Adequacy → → →					
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall Difficulty of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)				Increasing Difficulty → → →					
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions										
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe			
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.									
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)				Increasing Safety → → →					
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>E. WRIGHTSTILL AVERY</u>	Run No.: <u>136</u>	Date: <u>11/6/2018</u>
Please Circle Conditions. Answer only questions that are applicable to the exercise.		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded  <input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>S 10kts</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> Max flood Max ebb	
Swell: Dir. From/Height	<u>1m S</u>	Seas: Dir. From/Height
Visibility:	<u>Day – Clear FOG</u>	
Assist Tugs Bollard Pulls:	<u>N/A</u>	
Transit To / From:	<u>INBOUND PASSING AREA 2</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>2 degrees</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
<u>N/A</u>		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

**Norfolk  
Pilot Run Evaluation  
October and November 2018**

Tug Adequacy Rating for Tested Conditions										
Tug Adequacy Rating	1= Inadequate	5=Average					10=Most Adequate			
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.										
Tug Adequacy	(Circle Choice)      Increasing Adequacy → → →									
Tug Configuration and Reserve Capacity	1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)										

Overall <i>Difficulty</i> of Maneuver for Tested Conditions										
Difficulty Rating Scale	1=Not Difficult	5=Difficulty of an Average Transit					10=Most Difficult			
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions										
Run Difficulty	(Circle Choice)      Increasing Difficulty → → →									
Overall Difficulty	1	2	3	4	5	6	7	8	9	10

Overall <i>Safety</i> of Run for Tested Conditions										
Explanation of Scale	1=Unsafe	5=Average Safety					10=Very Safe			
<b>1. Unsafe</b>	Expect tug or ship to regularly ground in real-world conditions.									
<b>2. Not Acceptable</b>	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.									
<b>3. Marginally Acceptable</b>	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.									
<b>5. Average</b>	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions									
<b>10. Very Safe</b>	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions									
Safety Rating Scale	1=Unsafe	5=Average Safety					10=Most Safe			
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.										
Run Safety	(Circle Choice)      Increasing Safety → → →									
Overall Safety	1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety										

Norfolk  
Pilot Run Evaluation  
October and November 2018

Pilot: <u>JACOB JOHNSON</u>	Run No.: <u>136</u>	Date: <u>11/6/18</u>
<i>Please Circle Conditions. Answer only questions that are applicable to the exercise.</i>		
Model:	<input checked="" type="checkbox"/> Container Kalina_Norfolk A – Draft 14.9 m / 49 ft <input type="checkbox"/> Bulk Zhong Xing Hai – Draft 15.5 m / 50.9 ft <input type="checkbox"/> Container MSC Oscar_Norfolk A – Draft of 14.9 m / 49 ft	<input type="checkbox"/> Loaded
		<input type="checkbox"/> Ballast
Wind Direction / Speed (kt):	<u>SID</u>	
Current Direction/ Speed (kt):	<input checked="" type="checkbox"/> <u>Max flood</u> <input type="checkbox"/> Max ebb	
Swell: Dir. From/Height		Seas: Dir. From/Height
Visibility:	Day – Clear <u>FOG</u>	
Assist Tugs Bollard Pulls:		
Transit To / From:	<u>CBBT → MEETING AREA Z</u>	
1. Were you able to successfully make the transit from / to the pilot station, anchorage or terminal, and maintain the desired drift angle that provided safe margins from shoal areas (If not, why?)		
<u>YES MINIMAL DRIFT ANGLE NEEDED TO MAINTAIN POSITION IN THE CHANNEL 350'-370' ALLOW SAFE MEETING</u>		
2. What was the average drift angle and minimum speed necessary to offset the currents, swell/seas, and wind when approaching the terminal?		
<u>3° @ 10 KTS</u>		
3. Were you able to successfully complete the berthing / un-berthing evolutions? If not, what were the factors that prevented a safe evolution? Also, were the waves a limiting factor? Current? Wind?		
4. Did the ship model react as expected with given environmental conditions (wind, wave, current)? If no, what was different?		
<u>YES</u>		
5. Did you maintain an acceptable distance from the shoals?		
<u>YES</u>		
6. Would you modify your transit plan if you repeated this run? If so, what would be the differences?		
<u>NO</u>		

Norfolk  
Pilot Run Evaluation  
October and November 2018

Tug Adequacy Rating for Tested Conditions													
Tug Adequacy Rating	1= Inadequate			5=Average			10=Most Adequate						
7. Rate the adequacy of the number of assist tugs, configurations, and reserve power for this run. Use "1" as inadequate, "5" as indicating average and 10 as excellent, most adequate.													
Tug Adequacy				(Circle Choice)			Increasing Adequacy → → →						
Tug Configuration and Reserve Capacity				1	2	3	4	5	6	7	8	9	10
8. Please list any "qualifiers" to the above rating (type of tug, location, minimum bollard pull, experience of tug master, etc.)													

Overall Difficulty of Maneuver for Tested Conditions													
Difficulty Rating Scale	1=Not Difficult			5=Difficulty of an Average Transit			10=Most Difficult						
9. Rate the level of difficulty of this exercise transit if this was real-world pilotage conditions													
Run Difficulty				(Circle Choice)			Increasing Difficulty → → →						
Overall Difficulty				1	2	3	4	5	6	7	8	9	10

Overall Safety of Run for Tested Conditions													
Explanation of Scale	1=Unsafe			5=Average Safety			10=Very Safe						
1. Unsafe	Expect tug or ship to regularly ground in real-world conditions.												
2. Not Acceptable	Don't expect grounding, but excessive drift angle to maintain track line, and maximum tug power needed for extended period in real-world conditions.												
3. Marginally Acceptable	Expect to maintain track line with safe drift angle, but full tug power needed for extended periods in real-world conditions.												
5. Average	Expect to maintain track line, safe drift angle and safe reserve tug power in real-world conditions												
10. Very Safe	Expect to maintain track line, safe drift angle, and 30% or more reserve tug power at all times to handle unexpected events or emergencies in real-world conditions												
Safety Rating Scale	1=Unsafe			5=Average Safety			10=Most Safe						
10. Rate the safety of this run. Use "1" as unsafe and "5" as indicating average.													
Run Safety				(Circle Choice)			Increasing Safety → → →						
Overall Safety				1	2	3	4	5	6	7	8	9	10
11. Please list any "qualifiers" to the above safety rating (senior pilot only, environmental limits, restricted to daylight transits, etc.), or any additional recommendations to enhance navigation safety													

## Unit Conversion Table

Multiply	By	To Obtain
degrees (angle)	0.01745329	radians
feet	0.3048	meters
horsepower (550 foot-pounds force per second)	745.6999	watts
knots	0.5144444	meters per second
miles (U.S. statute)	1,609.347	meters
square feet	0.09290304	square meters

## Acronyms and Abbreviations

AOC	Atlantic Ocean Channel
CADD	computer aided design and drafting
CBBT	Chesapeake Bay Bridge Tunnel
CENAO	US Army Engineer District, Norfolk
CH	Cape Henry
ERDC	U.S. Army Engineer Research and Development Center
ft	foot/feet
GRR	General Reevaluation Report
in.	inch/inches
LPCT	Lamberts Point Coal Terminalx
m	meter/meters
M&N	Moffet & Nichol
MITAGS	Maritime Institute of Technical and Graduate Studies
NED	National Economic Development Plan
NHEC	Norfolk Harbor Entrance Channel
NHER	Norfolk Harbor Entrance Reach
NIT	Norfolk Internationl Terminals
NOAA	National Oceanic and Atmospheric Administration
PED	Preconstruction Engineering Design

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RPM	rotations per minute
SCHISM	Semi-implicit Cross-scale Hydrosience Integrated System Model
sec	second/seconds
SHS	Ship Handling Simulators
TSC	Thimble Shoal Channel
ULCV	ultra-large container vessel
USACE	U.S. Army Corps of Engineers
VIG	Virginia International Gateway
VIMS	Virginia Institute of Marine Science
VPA	Virginia Port Authority

# REPORT DOCUMENTATION PAGE

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<b>14. ABSTRACT</b> In 2018, the U.S. Army Engineer Research and Development Center (ERDC), Coastal and Hydraulics Laboratory, participated in a navigation study to assist the Virginia Port Authority evaluation of a proposed channel widening alternative for the Port of Norfolk, Virginia. The proposal will allow large coal colliers and containerships to load to a deeper draft. The proposals also included deepening portions of Norfolk Harbor and providing additional widening in one section for two-way traffic. The simulations were conducted at the Maritime Institute of Technical and Graduate Studies (MITAGS) facility in Linthicum, MD. Moffatt & Nichol directed the simulation and modeling efforts, with assistance from Webb Simulation Consulting. The U.S. Army Engineer District, Norfolk, and ERDC provided oversight to ensure that all U.S. Army Corps of Engineers simulator study requirements were met. The MITAGS simulator includes a variety of environmental forces act upon the ship during the simulation transit. These include currents, wind, waves, bathymetry, and ship-to-ship interaction. Online simulations of the project were conducted at MITAGS. Seven mariners including harbor pilots and a master mariner participated in the testing and validation exercises. Results in the form of track plots and pilot questionnaires were reviewed to develop final conclusions.					
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