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(Installations and
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Evaluating the Impact of Emerging Contaminants Using ECATSM and ICATSM

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Agenda

■ Background

- Emerging Contaminants (ECs)

■ Tools

- Objectives
- Emerging Contaminants Assessment Tool (ECATSM)
- Impact Criteria Assessment Tool (ICATSM)

■ Application

- Naphthalene

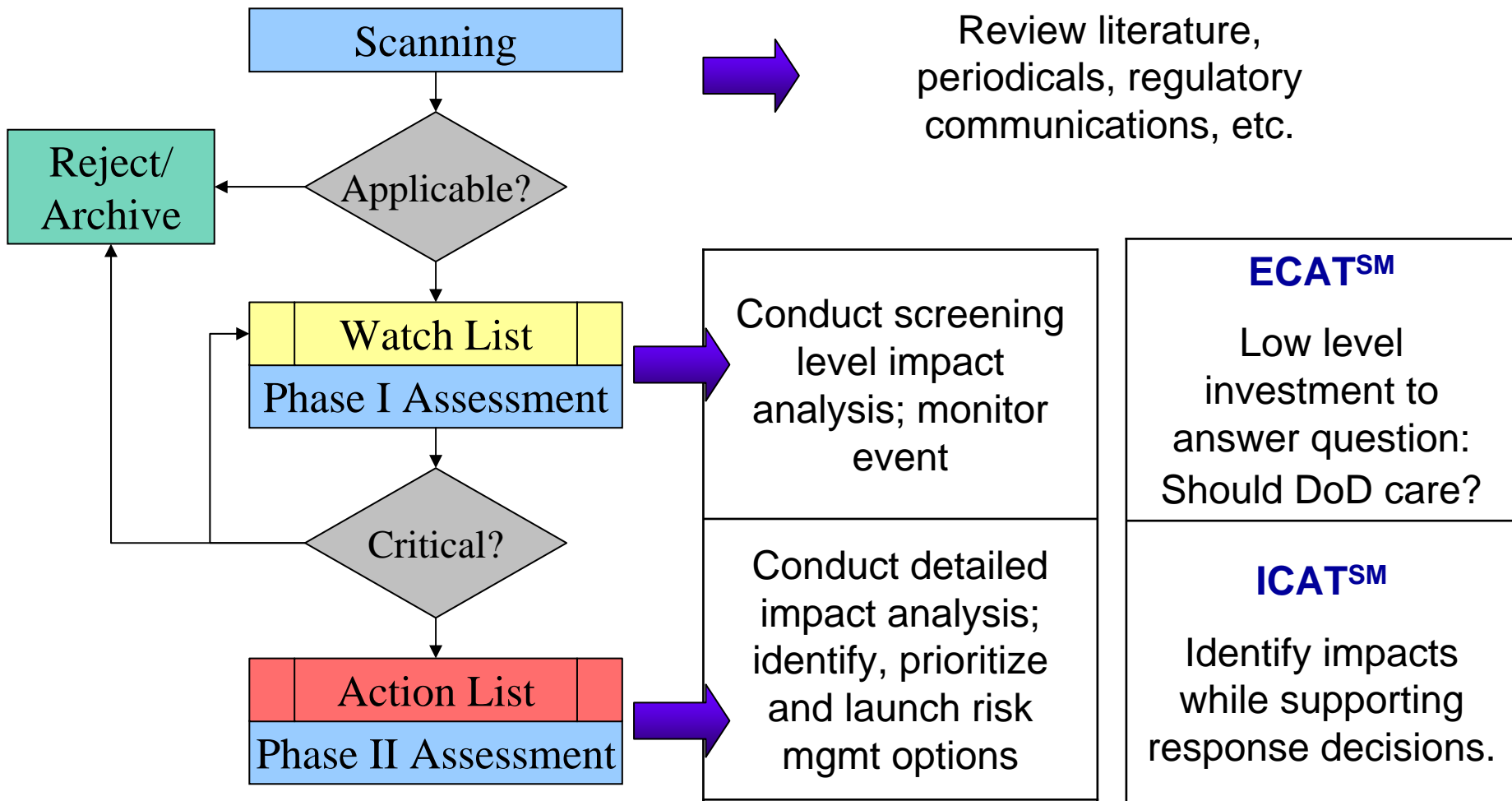
Emerging Contaminants (ECs)

- Chemical or material
- Real or perceived threat to human health or the environment
- No peer reviewed health standard or an evolving standard
- Evolving regulatory interest
- May also have
 - Insufficient human health or environmental data/science
 - New detection limit
 - New sources or pathways of exposure

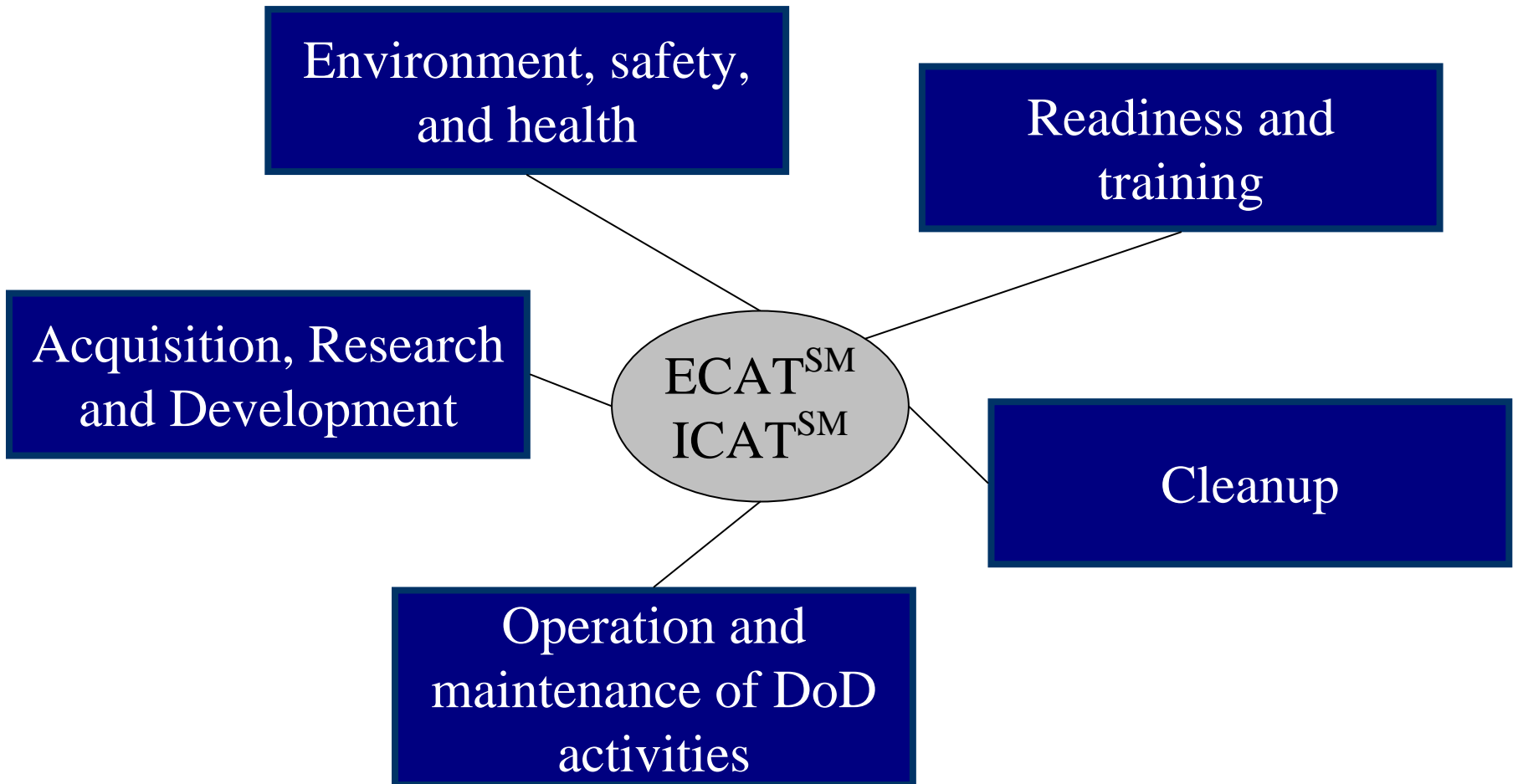
Objective

- Develop tools for evaluating the impacts of new or changing ESOH regulations and standards on DoD operations and mission.
 - Emerging Contaminants Assessment Tool (ECATSM)
 - Impact Criteria Assessment Tool (ICATSM).

Support MERIT EC Assessment Process



Impact Areas



ECATSM

■ What it is?

- MS Excel[®] spreadsheet tool for facilitating and documenting important database reviews by Subject Matter Experts (SMEs).

■ What does it do?

- Establishes a process for evaluating EC with widely-available, generally-accepted databases to determine the severity and impact of changing regulations on the DoD.

■ Why is it important?

- Facilitates a review of key database information categories for use by SMEs in a manner that is consistent, defensible, and documented for Phase I activities

Directs SMEs to Public Access Databases

Public Access Databases	Sections of Interest
ToxProfiles	Health Effects, Potential for Human Exposure, General Population & Occupational Exposure
IRIS	Carcinogenic Assessment for Lifetime Exposure
HSDB	Human Health Effects, Environmental Fate & Transport, Manufacturing Information
CERCLIS	List of sites with contaminant, Ranking of potential and actual human exposures
Scorecard	Human Health Hazards, Hazard Rankings, Chemical Use Profile, Chemicals Reported by Environmental Releases
Priority Chemicals and Fact Sheets	Uses of a Contaminant, Potential Health Effects, Routes of Exposure
TRI	Substance Identification, Environmental Release of Chemical
TRI e-FDR	Chemical Information
SIRI MSDS Index	Hazards Identification, Exposure Controls/Personal Protection, Toxicological Information, Ecological Fate
Household Products	Category, Percent
ITER	Risk Data
TOXMAP	Identify Releases
ChemIDPlus	Toxicity
CCRIS	Carcinogenicity Studies, Mutagenicity Studies
GENE-TOX	Mutagenicity Studies
TRI Explorer	Total Off-site Disposal or Other Releases, Total On and Off-Site Disposal or Other Releases
ATSDR	Health Effects, Production, Import, Use & Disposal, Potential for Human Exposure, Regulations & Advisories, Appendices
TOXLINE	Abstracts
DART	Abstracts
Table Z-1	Air Contamination Values
Table Z-2	Acceptable Ceiling Concentration
Table Z-3	Exposure Limits

Directs SMEs to Limited Access Databases

Limited Access Databases	Sections of Interest
HMIRS	Hazards Identification, Exposure Controls/Personal Protection, Toxicological Information, Ecological Fate
FEDLOG	Items in the DoD Supply System
MIDAS	Chemicals used in munitions
ERIS	Chemical, Geological, Geographical, & Remedial Action Data
NORM	Analytical Chemistry Samples, Tests, Results, Hydrogeological Information, Site/Location Descriptions, Monitoring Well Characteristics
AF-EMIS	Hazardous material tracking, MSDSs, Electronic review and authorization
HSMS	Tracking of hazardous products, chemicals, waste containers, container contents
TRI DDS	Environmental exposure data
ERLS	Daily chemical and isotope inventories, Notification of chemicals nearing of exceeding threshold quantities
DoD Occupational Database	Data on DoD personnel

SME Assigns Potential Impact Scores

- For each database and each impact area, SME assigns a potential impact score (6 for “Very High”, 2 for “Very Low, and 1 for databases that are not applicable or provide no useful information).
- Under the “Comments” section, SMEs list any relevant information about the contaminant.

	Database	Access Site	Categories of Interest	Environment, Safety & Health	Readiness & Training	Acquisition/R&D	O&M of DoD Assets	Cleanup	
4	PUBLIC ACCESS DATABASES								
5	ToxProfiles	http://www.atsdr.cdc.gov/toxpro2.html#A-	<p>ToxProfiles is organized by contaminant name.</p> <ul style="list-style-type: none"> • Health Effects: health effects resulting from contaminant exposure • Potential for Human Exposure: discusses routes of contamination, provides a figure that illustrates the frequency of sites with contamination • General Population & Occupational Exposure 	6 - Very High	6 - Very High	6 - Very High	6 - Very High	6 - Very High	<ul style="list-style-type: none"> ▶ Evaporates easily, through air ▶ Easily passes thru contaminate well wat ▶ Exposure can rest ▶ Has been found to nose and lung tumor ▶ Frequently present emission, naturally o and emissions, usec resins, and insectic
6				5 - High	5 - High	5 - High	5 - High	5 - High	
7				4 - Moderate	4 - Moderate	4 - Moderate	4 - Moderate	4 - Moderate	
8				3 - Low	3 - Low	3 - Low	3 - Low	3 - Low	
9				2 - Very Low	2 - Very Low	2 - Very Low	2 - Very Low	2 - Very Low	
10				1 - N/A	1 - N/A	1 - N/A	1 - N/A	1 - N/A	
11				5	4	5	4	5	
12									

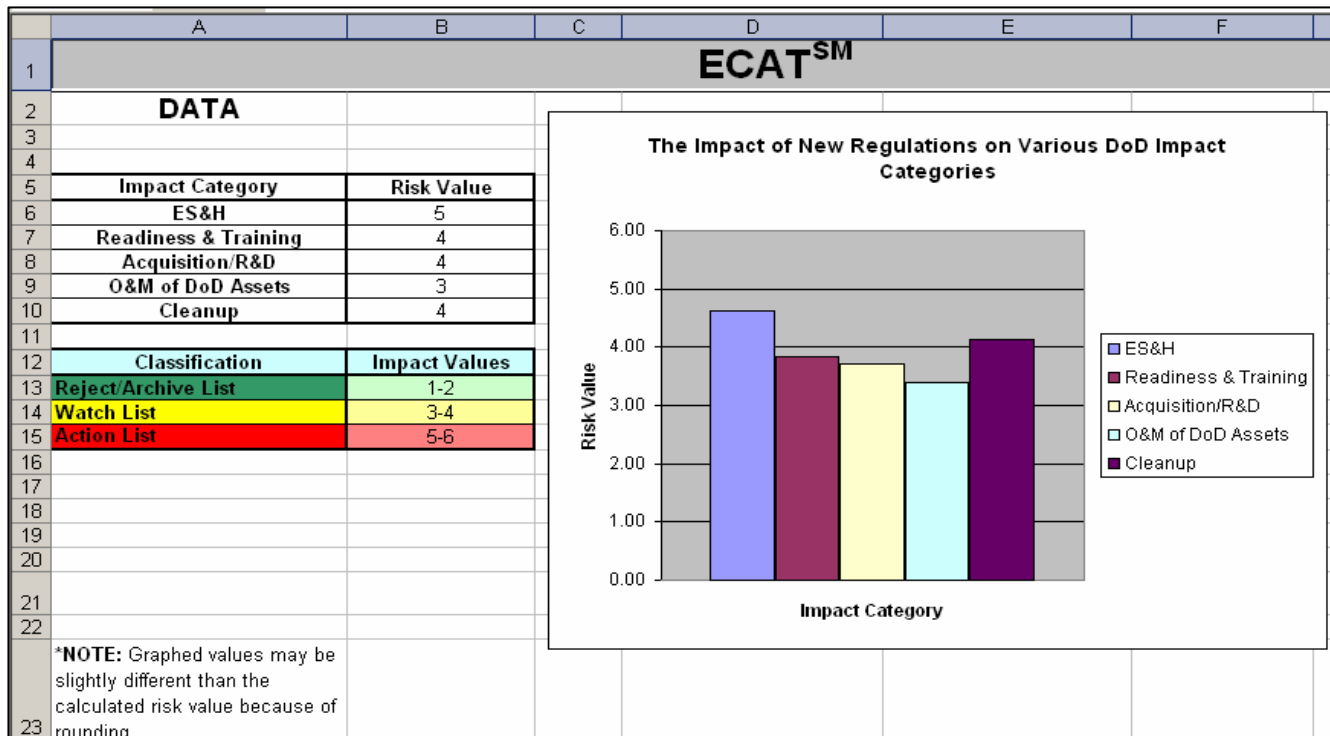
ECATSM Calculates Contaminant Impact Value

- ECATSM calculates a “Contaminant Impact Value” (CIV).
- Used to suggest how the EC should be classified
 - Action List: 21-30
 - Watch List: 11-20
 - Reject/Archive List: 1-10.

	A	B	C
1	ECATSM		
2	NAPHTHALENE		
3	91-20-3		
4			
5	Table 1. Values for determination of the impact of a contaminant to the DoD if all five impact factors are considered.		
6	Contaminant Impact Value	Classification	Impact Values
7	20	Reject/Archive List	1-10
8		Watch List	11-20
9		Action List	21-30
10		Conclusions/Comments	
11			
12			

ECATSM Provides Impact Category Comparison

- Based on SME input, ECATSM compares the impact of new regulations across the Impact Categories.



ICATSM

■ What it is?

- MS Excel[®] spreadsheet tool for determining the likelihood and severity of impact of new/changing regulations on DoD facilities.

■ What does it do?

- Establishes a risk scoring system for evaluating the likelihood of an adverse impact as a result of regulatory, scientific, or political changes for emerging contaminants.

■ Why is it important?

- Facilitates the assigning of a risk score and prioritizing those risks for action in a manner that is consistent, defensible, and documented for risk balancing activities.

SME Considers Impact Categories

- For each Impact Category, the SME evaluates the types and sources of risk.
- For example, major ES&H Impact Categories include:
 - Chemical Release
 - Scope of Exposure
 - Relative Change in Health Endpoint.

ICAT SM				
CONTAMINANT 1				
CAS No. ###-###-#				
ES&H Impact Category	Evaluation Criteria	Likelihood of an Adverse Impact as a Result of Regulatory, Scientific, or Political Change (%)	Severity of the Impact to the DoD	Overall Risk of ES&H Impact Factor to the DoD
		0.05: Will not happen or is very unlikely 0.1: There is a slight possibility that the impact element will be affected 0.3: The impact element may be affected 0.5: The impact element probably will be affected 0.8: The impact element will definitely be affected	0.01-0.12: Low Risk; Reject/Archive List 0.13-0.34: Moderate Risk; Watch List 0.35-0.64: High Risk; Action List	
Chemical Release	Is DoD releasing the material? Is the release actual or potential? How much has been released, is being released, will be released? Is the release in land, air or water? Is the release time dependent? How many facilities are releasing the chemical? What facilities are releasing the chemical? Are DoD contractors releasing the chemical?	0.00	0.00	0.00
Scope of Exposure	How widespread is exposure? How many people will be affected? Will they be military, DoD civilian or civilian? What is the extent of the actual or potential exposure? Has exposure already occurred? Will exposure be limited to certain geographical areas? Will endangered species be threatened?	0.00	0.00	0.00
Relative Change in Health Endpoint	How does the new or proposed rule compare with current allowable limits? What is the effect on human health? What are the pathways of exposure? Will release harm the environment or endangered species?	0.00	0.00	0.00
OVERALL RISK		0.00	0.00	0.00

SME Considers Evaluation Criteria

- Is the DoD releasing the material?
- How many facilities are releasing the chemical?
- How widespread is exposure?
- How does the new or proposed rule compare with current allowable limits?

ICAT SM				
CONTAMINANT 1				
CAS No. ###-###-##				
ES&H Impact Category	Evaluation Criteria	Likelihood of an Adverse Impact as a Result of Regulators, Scientific, or Political Change (%)	Severity of the Impact to the DoD	Overall Risk of ES&H Impact Factor to the DoD
		0.05: Will not happen or is very unlikely 0.1: There is a slight possibility that the impact element will be affected 0.3: The impact element may be affected 0.5: The impact element probably will be affected 0.8: The impact element will definitely be affected	- Exposure to the material/chemical of interest will not have any serious health repercussions. - Measures can be easily taken to protect workers from any harmful effects. - Release of the chemical/material will not affect the health and safety of surrounding communities. - Release of the chemical/material will have little or no impact on the environment 0.8: - Material is toxic. - Amount that would be released is significantly higher than currently allowed amounts. - Exposure to the material/chemical of interest could lead to a debilitating illness or death. - Adequate safeguards are not	0.01-0.12: Low Risk; Reject/Archive List 0.13-0.34: Moderate Risk; Watch List 0.35-0.64: High Risk; Action List
Chemical Release	Is DoD releasing the material? Is the release actual or potential? How much has been released, is being released, will be released? Is the release in land, air or water? Is the release time dependent? How many facilities are releasing the chemical? What facilities are releasing the chemical? Are DoD contractors releasing the chemical?	0.00	0.00	0.00
Scope of Exposure	How widespread is exposure? How many people will be affected? Will they be military, DoD civilian or civilian? What is the extent of the actual or potential exposure? Has exposure already occurred? Will exposure be limited to certain geographical areas? Will endangered species be threatened?	0.00	0.00	0.00
Relative Change in Health Endpoint	How does the new or proposed rule compare with current allowable limits? What is the effect on human health? What are the pathways of exposure? Will release harm the environment or endangered species?	0.00	0.00	0.00
OVERALL RISK		0.00	0.00	0.00

SME Evaluates Likelihood of an Adverse Impact

- 0.05: Will not happen or is very unlikely.
- 0.1: There is a slight possibility that the impact area will be affected.
- 0.3: The impact area may be affected.
- 0.5: The impact area probably will be affected.
- 0.8: The impact area will definitely be affected.

ICAT SM					
CONTAMINANT 1					
CAS No. ###-##-#					
	ES&H Impact Category	Evaluation Criteria	Likelihood of an Adverse Impact as a Result of Regulatory, Scientific, or Political Change (%)	Severity of the Impact to the DoD	Overall Risk of ES&H Impact Factor to the DoD
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6					
7					
8					
9					
10					
11	Scope of Exposure	How widespread is exposure? How many people will be affected? Will they be military, DoD civilian or civilian? What is the extent of the actual or potential exposure? Has exposure already occurred? Will exposure be limited to certain geographical areas? Will endangered species be threatened?	0.00	0.00	0.00
12					
13					
14					
15					
16					
17					
18					
19					
20	Relative Change in Health Endpoint	How does the new or proposed rule compare with current allowable limits? What is the effect on human health? What are the pathways of exposure? Will release harm the environment or endangered species?	0.00	0.00	0.00
21					
22					
23		OVERALL RISK	0.00	0.00	0.00

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SME Evaluates the Severity of Impact

Different scoring criteria for each impact area based on the following general scoring system.

- 0.0-0.2: Low severity, not widespread, minimal changes, substitutes, available at comparable cost.
- 0.2 - 0.6: Medium severity, slight disruptions, substitutes more expensive.
- 0.6 - 0.8: High severity, widespread, major change required, technology not available.

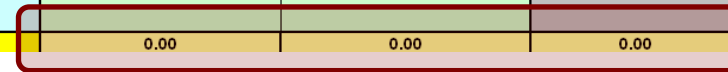
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Scope of Exposure	How widespread is exposure? How many people will be affected? Will they be military, DoD civilian or civilian? What is the extent of the actual or potential exposure? Has exposure already occurred? Will exposure be limited to certain geographical areas? Will endangered species be threatened?	0.00	0.00	0.00
Relative Change in Health Endpoint	How does the new or proposed rule compare with current allowable limits? What is the effect on human health? What are the pathways of exposure? Will release harm the environment or endangered species?	0.00	0.00	0.00
OVERALL RISK		0.00	0.00	0.00

ICATSM Generates Risk Rating

- Overall Likelihood of an Impact.
- Overall Severity of the Impact.
- Overall Risk of ES&H Impact Area.

ICAT SM					
CONTAMINANT 1					
CAS No. ###-###-#					
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7					
8					
9					
10					
11					
12	Scope of Exposure	How widespread is exposure? How many people will be affected? Will they be military, DoD civilian or civilian? What is the extent of the actual or potential exposure? Has exposure already occurred? Will exposure be limited to certain geographical areas? Will endangered species be threatened?	0.00	0.00	0.00
13					
14					
15					
16					
17					
18					
19	Relative Change in Health Endpoint	How does the new or proposed rule compare with current allowable limits? What is the effect on human health? What are the pathways of exposure? Will release harm the environment or endangered species?	0.00	0.00	0.00
20					
21					
22					
23		OVERALL RISK	0.00	0.00	0.00

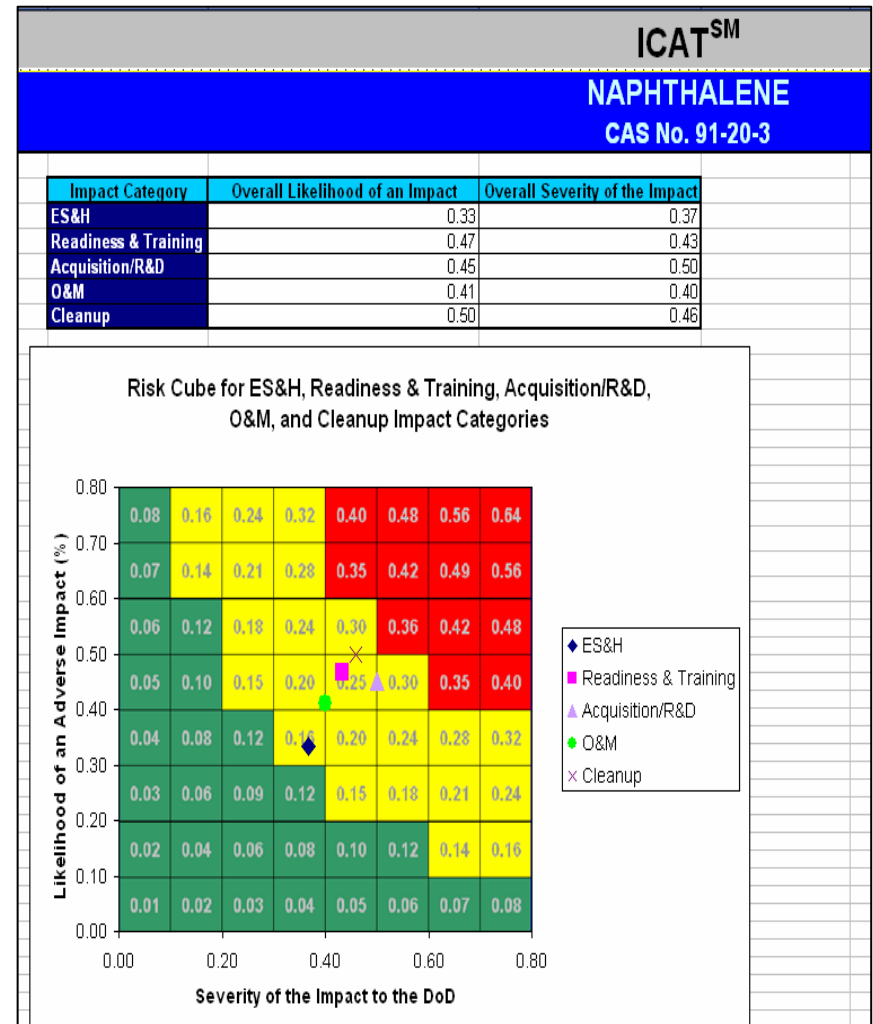
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ICATSM Generates Risk Cube

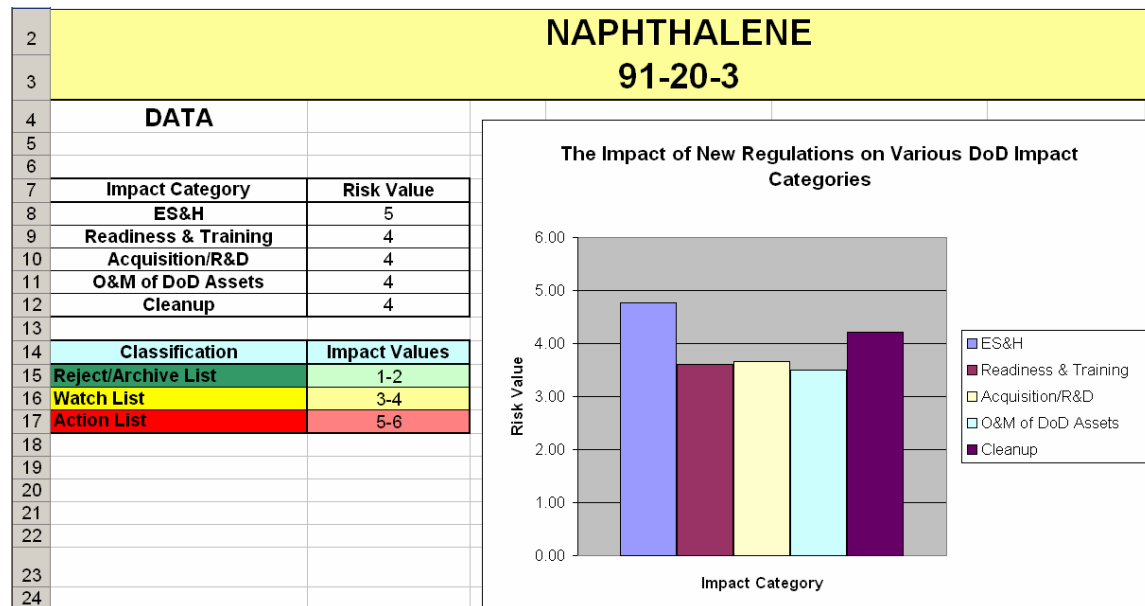
■ Risk cubes generated with risk values for each individual Impact Category:

- Action List: RED (0.01-0.12)
- Watch List: AMBER (0.13-0.29)
- Reject/Archive List: GREEN (0.30-0.64)



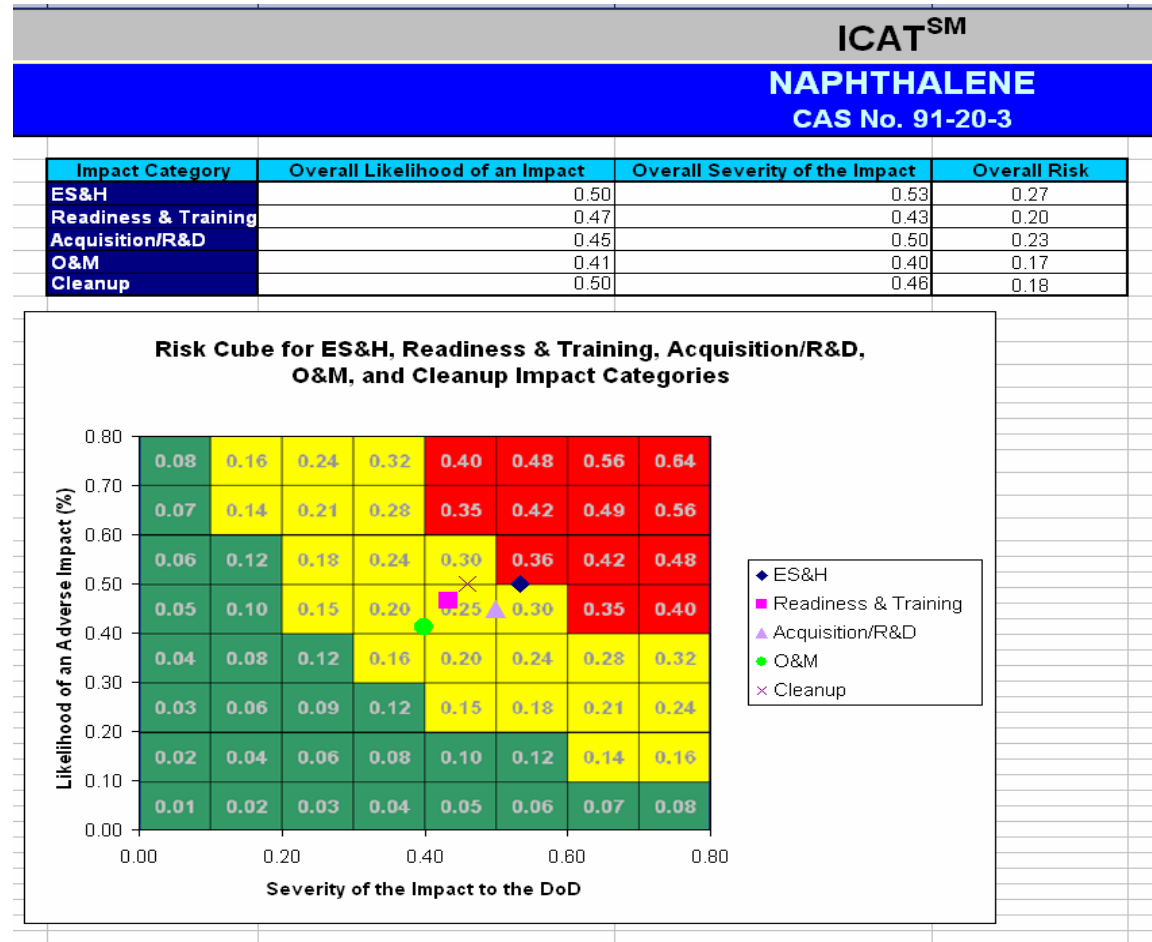
Application of ECATSM to Naphthalene

- CIV of 20 places naphthalene at the top of the Watch List.
- Health risks include hemolytic anemia, cataracts, cell damage.
- Common component of petroleum products.
- Rating will increase if toxicity studies show naphthalene to be a human carcinogen.



Application of ICATSM to Naphthalene

- Places naphthalene on the Watch List for all impact categories.
- Suggests that a Phase II assessment should be performed.



Questions

Materials of Evolving Regulatory Interest Impact Assessment

Project No. 0429-OSD2

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