Nuclear Safety Information Dashboard

QuickStart Guide

September 2012

Office of Analysis (HS-24)
Office of Environmental Protection, Sustainability Support
and Corporate Safety Analysis
Office of Health, Safety and Security (HSS)

Purpose of Nuclear Safety Information (NSI) Dashboard

- The NSI Dashboard provides a new user interface to the Occurrence Reporting and Processing System (ORPS) to easily identify, organize, and analyze nuclear safety-related events reported into ORPS.

- ORPS reporting criteria associated with events at nuclear facilities have pre-assigned weighting factors according to their relative importance and are placed into groups.

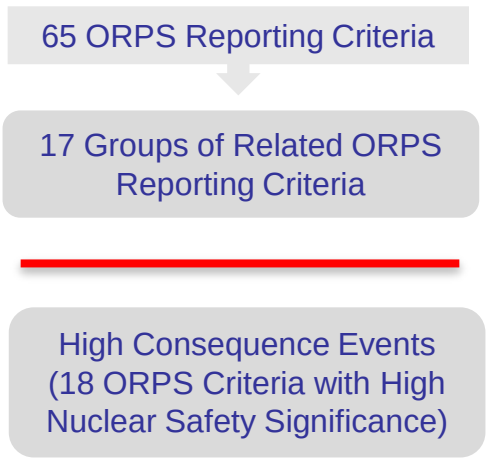
- This information can be evaluated to identify trends and, using insights from current events and nature of operations, enable further evaluation to prevent potential high consequence events.

Task Group Development of NSI Dashboard

- NSI Dashboard was developed by HS-24-led Task Group that included line organizations.
- NSI Dashboard includes ORPS reporting criteria indirectly related to nuclear safety - this considers the impact of the broader organizational culture on nuclear safety.
- Task Group selected ORPS reporting criteria and assigned weighting factors to produce a DOE corporate perspective.
- Task Group used an analytical process to assign weighting factors; proposed additional analytical capabilities for the dashboard.
- Dashboard includes additional “drill down” analytical abilities that are responsive to customer input.

Basics of the NSI Dashboard

- ORPS reporting criteria (ORC) associated with nuclear safety at a nuclear facility are used (65 ORC).
- Each ORC was assigned a weighting factor based on an analytical technique that considered its importance to nuclear safety.
- Related ORC were combined into Groups (17).
- Groups are trended over time and evaluated.
- Trends and insights from current events and knowledge of the nature of operations at particular sites enable further evaluation to prevent potential high consequence events (18 ORPS reporting criteria – e.g., unplanned explosion within nuclear facility primary confinement).



Use of NSI Dashboard to Enable Actions to Prevent Future Nuclear Safety Events

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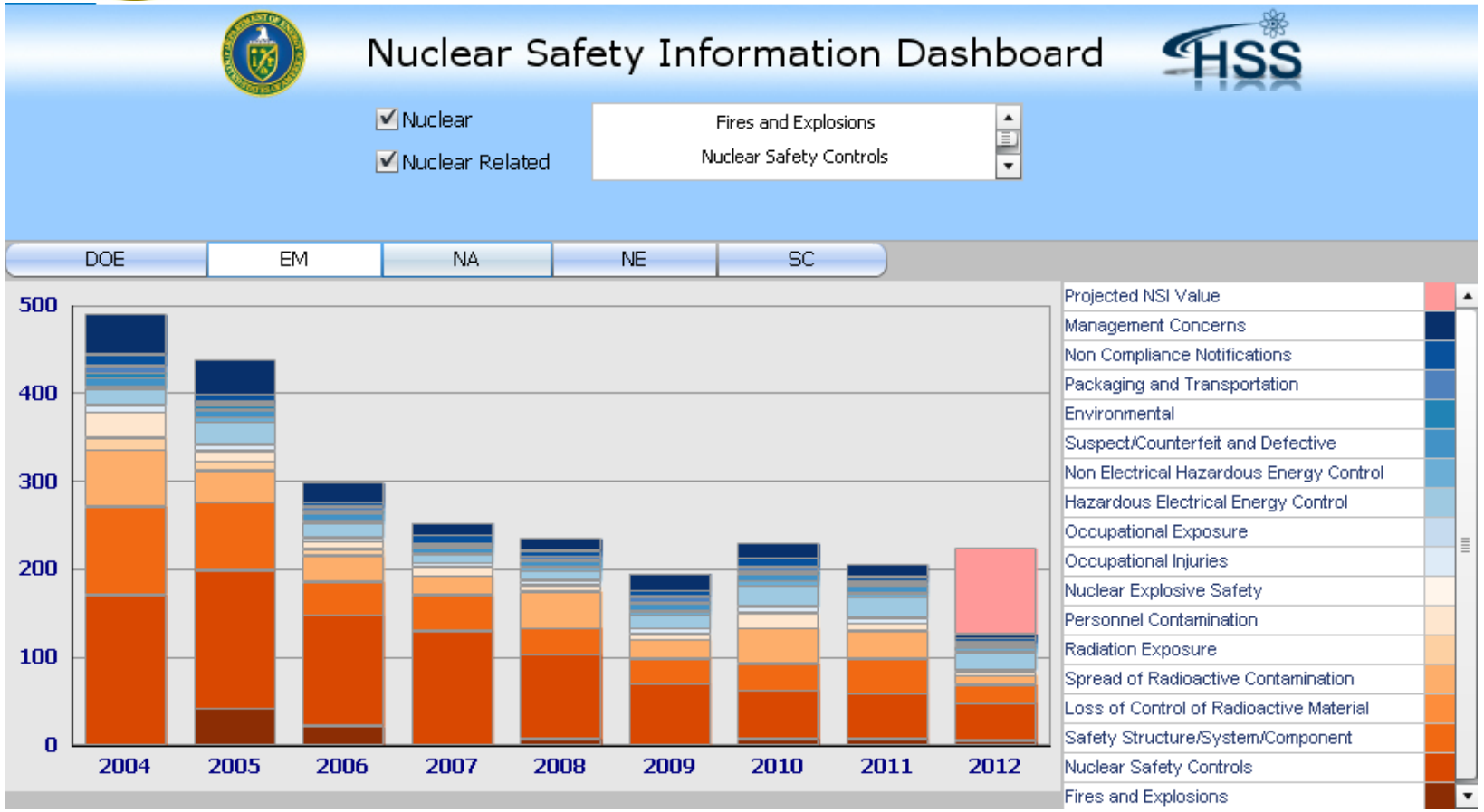
- NSI trends coupled with insights from current events and site-specific information enable appropriate actions to prevent potential high consequence events.
  - Enables organizations to use NSI trends to quickly identify individual or groups of ORPS occurrences responsible for an NSI increase or decrease, facilitating further targeted analysis of the events to understand their causes and impacts to nuclear safety. An example of how NSIs can be applied is provided in the Background Information section.
  - Organizations can use information gained from analyzing NSI trends in conjunction with other insights and information to develop a basis for appropriate, necessary actions (e.g., focused nuclear facility reviews; assistance; assistance visits; preparation of Operating Experience level 1-3 documents; senior leadership operational awareness; trending nuclear facility operations).

Features of the NSI Dashboard

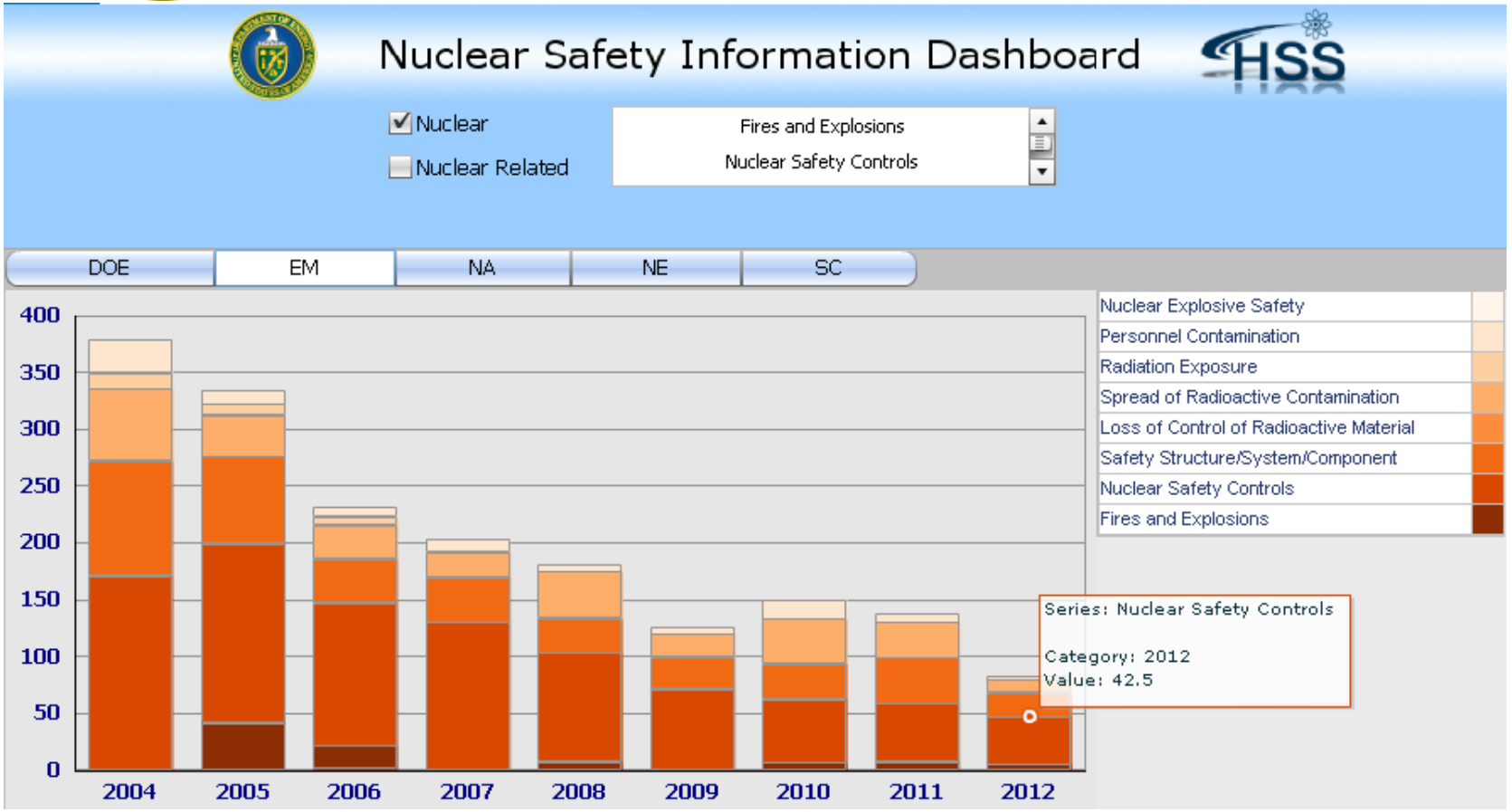
- Display nuclear-related ORPS information at the DOE, PSO, site and contractor levels.
- Filter groups and evaluate related information to identify trends.
- Evaluate cause code and keyword information.
- Provide direct links to associated ORPS reports.

Current Views of the NSI Dashboard



- Example NSI trend for EM displaying all 17 groups, plus a projected NSI value for 2012.

Current Views of the NSI Dashboard (continued)

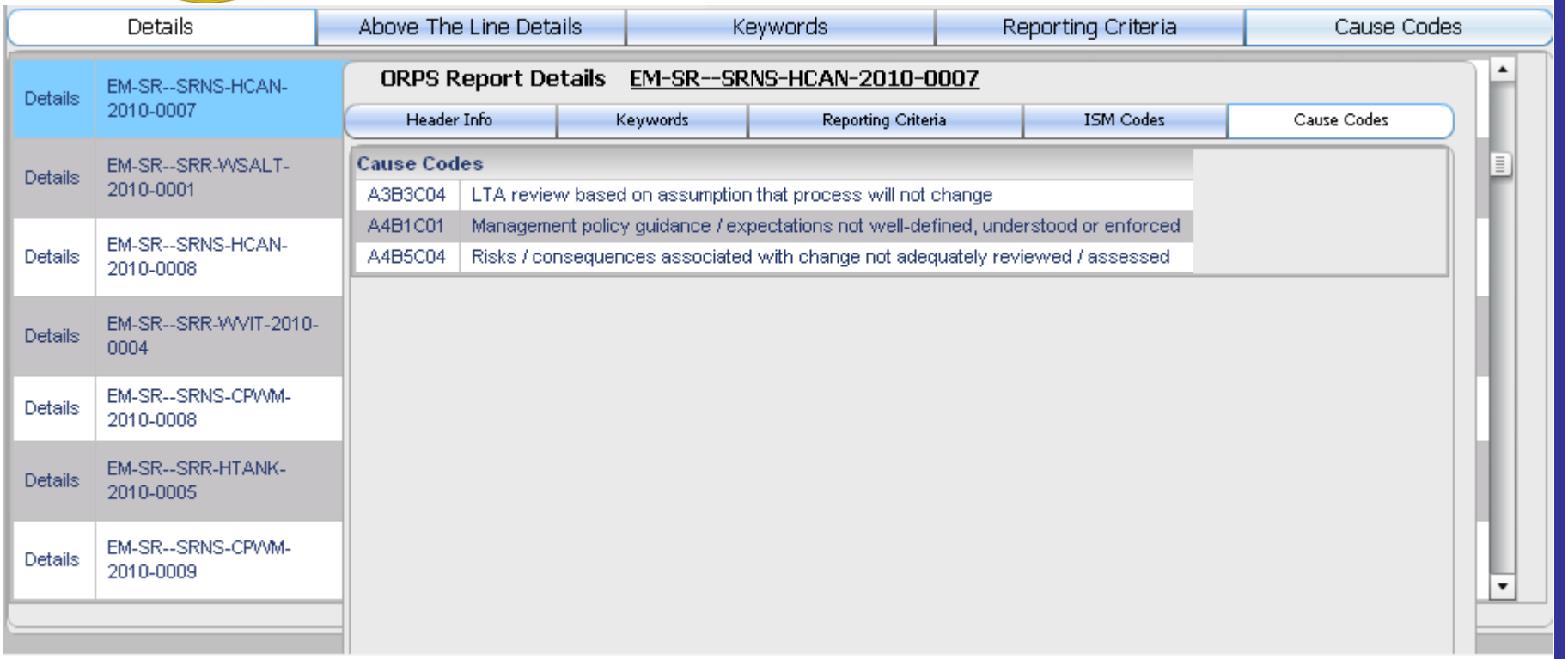


- Example showing only EM's nuclear safety groups. "Mousing" over an area of the stacked bar provides the name and value of the group.

Current Views of the NSI Dashboard (continued)

- Example NSI nuclear safety trend for EM operations at Savannah River.

Current Views of the NSI Dashboard (continued)



- Example of nuclear safety-related ORPS reports from 2010-2012 on the left, and the cause codes for the highlighted report in the pop-up box. Clicking on top-right cause code tab will show all cause codes assigned by the field to EM Savannah River ORPS reports from 2010-2012.

Background Information

ADDITIONAL
NUCLEAR SAFETY INFORMATION (NSI)
DASHBOARD INFORMATION

High Consequence Events (Events DOE Strives to Avoid)

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ORPS Criteria	Description	ORPS Criteria	Description
1(1), 1(2), 1(3), 1(4)	An Operational Emergency not requiring classification, an Alert, a Site Area Emergency, or a General Emergency	2A(1)	Fatality or terminal injury/illness due to DOE operations
2C(1)	Fire emergency/incident within primary confinement/containment boundaries of a nuclear facility, except fire that self-extinguishes < 10 minutes	2B(1)	Fatality, terminal injury/illness or in-patient hospitalization of 3 or more personnel resulting from acute exposure to a chemical, biological, or physical hazard due to DOE operations
2D(1)	Unplanned explosion within nuclear facility primary confinement/containment boundary	10(1)	Event resulting in DOE O 225.1B Federal Accident Investigation Board
3A(1)	Violation of nuclear facility's Technical Safety Requirement (or Operational Safety Requirement) Safety Limit		
3C(1)	No documented controls available to prevent criticality accident	5A(1)	Release (onsite/offsite) of hazardous or extremely hazardous substance, including radionuclides from a DOE facility above federally permitted releases in a quantity equal to or exceeding the federal reportable quantities
6A(1)	Radioactive material offsite > applicable DOE limits in DOE O 458.1 due to DOE operations/activities	5B(1)	Occurrence causing significant impact to ecological or cultural resource for which DOE has responsibility
6B(1)	Offsite radioactive contamination > applicable DOE limits in DOE O 458.1 or values in 10 CFR Part 835, Appendix D due to DOE operations/activities	8(1)	Offsite transportation incident involving HazMat that requires immediate 49 CFR Section 171.15(b) notice
6C(1)	Dose > limits in 10 CFR Part 835, Subpart C or DOE O 458.1 "Public Dose Limit"		
7(1)	Damage to nuclear explosive resulting in credible threat to nuclear explosive safety		

ORPS Reporting Criteria that Comprise Safety Structure/System/Component Group

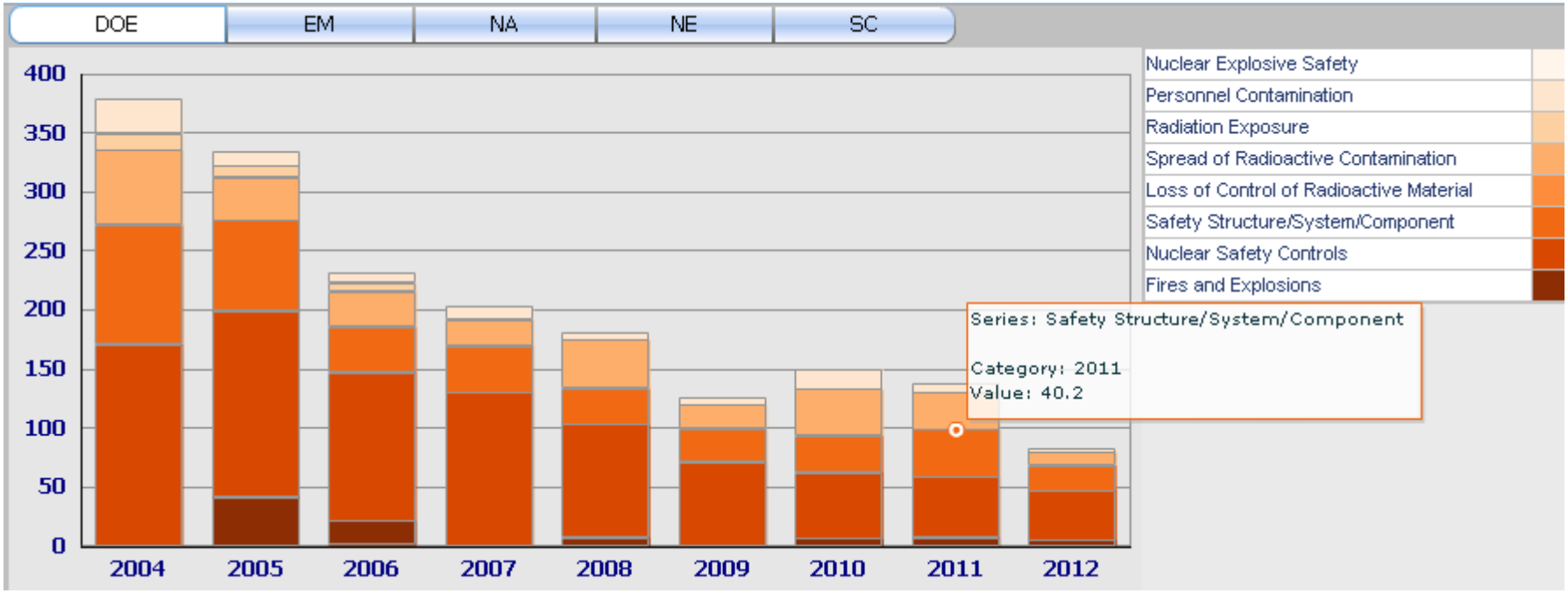
(an Example of a GROUP and Related ORPS REPORTING CRITERIA)

ORPS Criteria	Description
4A(1)	Performance degradation of any Safety Class (SC) or Safety Significant (SS) Structure, System, or Component (SSC)
4A(2)	Performance degradation of any Safety Class SSC when not required to be operable.
4B(1)	A formal change of operational mode or curtailment of work or processes) directed by a DOE Field Element Manager or Contracting Officer for safety reasons (e.g., a Stop Work Order).
4B(2)	Actuation of a Safety Class Structure, System, or Component (SSC), or its alarms as a result of an actual unsafe condition.
4B(3)	Actuation of a Safety Significant Structure, System, or Component (SSC), or its alarms as a result of an actual unsafe condition.
4B(4)	A facility evacuation, other than a precautionary evacuation or an evacuation due to false alarms or spurious alarms.
4B(5)	A facility operational event which resulted in an adverse effect on safety
4B(6)	A facility or operations shutdown (i.e., a change of operational mode or curtailment of work or processes), directed by senior contractor or senior DOE management for safety reasons, and requiring a corrective action(s) prior to continuing operations.
4B(7)	Any event or condition that would prevent immediate facility or offsite emergency response capabilities.

Nuclear Safety Information Dashboard Example

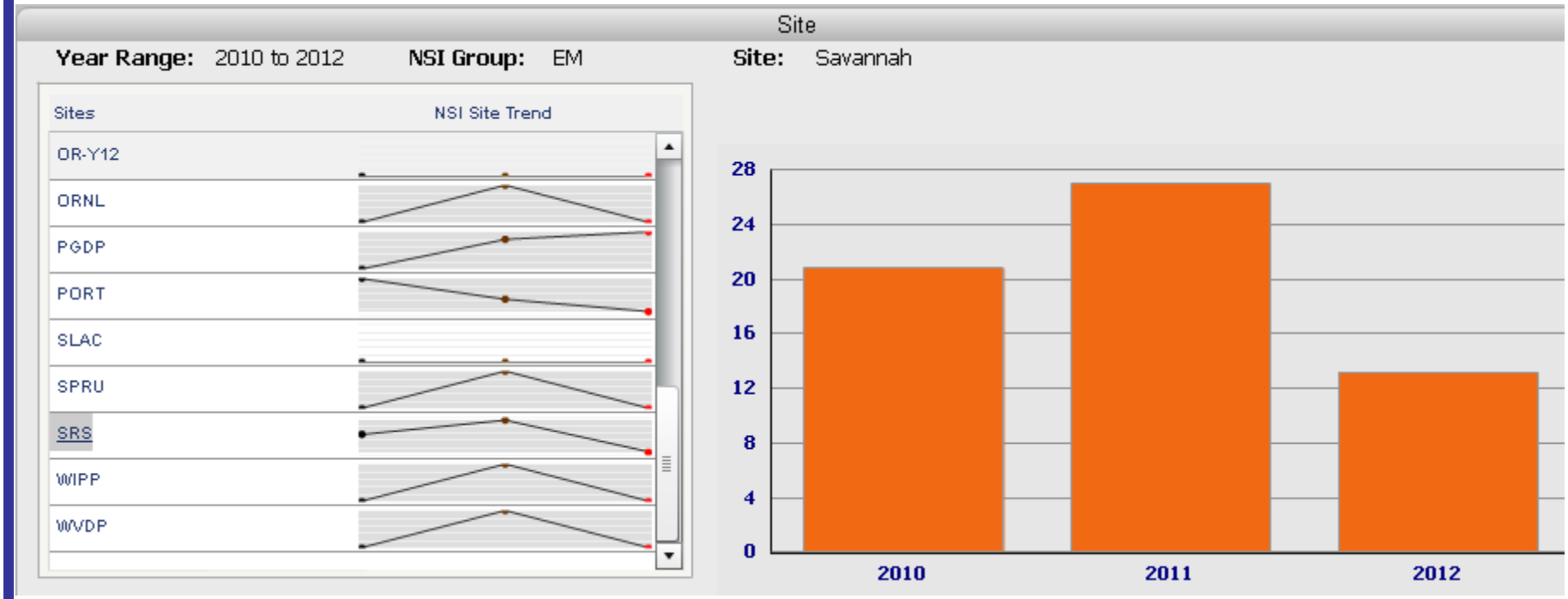
The following slides provide an example of how NSI information might be used to evaluate nuclear safety trends.

Nuclear Safety Information Dashboard Example



- While it appears that the overall EM NSI nuclear safety trend decreased from 2010 - 2011, the “Safety Structure/System/Component” group seems to have increased.
- The trend for individual EM sites can be evaluated.

Nuclear Safety Information Dashboard Example (continued)



- All of the other Savannah River nuclear safety groups can be filtered out, leaving just the “Safety Structure/System/Component” group.

Nuclear Safety Information Dashboard Example (continued)

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Details | Above The Line Details | Keywords | Reporting Criteria | Cause Codes

Cause Codes		Counts
A2B6C01	Defective or failed part	19
A3B1C01	Check of work was LTA	7
A3B1C03	Incorrect performance due to mental lapse	7
A2B6C04	End of life failure	6
A3B2C05	Incorrect situation ident lead to wrong rule used	6
A3B2C02	Signs to stop ignored and step performed errantly	5
A4B1C01	Mngmnt pol guid/expect ill-defined, understood or	5
A4B4C06	Job performance/self-checking standards improperly	5
A5B2C08	Incomplete / situation not covered	5
A1B1C03	Design input not correct	4
A1B2C03	Design output not correct	4

ORPS Report Details EM-SR--SRNS-HCAN-2011-0001

Header Info | Keywords | Reporting Criteria

Cause Codes	
A2B6C01	Defective or failed part

- ORPS reports in CY 2011 associated with the “Safety Structure/System/Component” group can be evaluated for associated cause codes and keywords.
- In 2011, 2 of the top 5 cause codes are related to equipment/materials - “defective or failed part” and “end of life failure.”
- “Incorrect performance due to mental lapse,” “check of work was less than adequate” and “situation incorrectly identified led to wrong rule being used” are also among the top 5.

Nuclear Safety Information Dashboard Example (continued)

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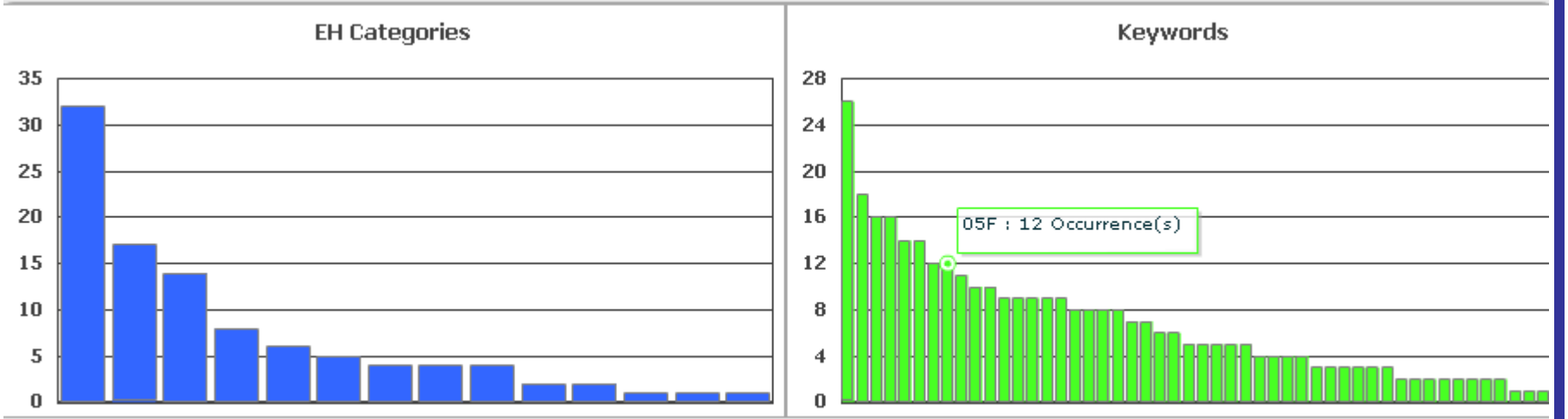
Details | Above The Line Details | Keywords | Reporting Criteria | Cause Codes



Keywords	
05F	Corrosion/Material Degradation

- These pareto charts for CY 2011 shows the distribution of headquarters-assigned keywords for all SRS EM ORPS reports.
- The high number of times (14, 12 and 10, respectively) the 5C(ventilation system/fan), 5F(Corrosion/material degradation/end of life) and 5D(mechanical equipment failure/damage) keywords were assigned corroborate the equipment/materials cause codes assigned by the field.

Nuclear Safety Information Dashboard Example (continued)

- Conclusions drawn from this analysis can be a starting point for evaluating information from other sources and may point to the need for a focused review of nuclear safety operations.

Contact Information

For additional information and assistance on the Nuclear Safety Information Dashboard please contact:

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