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Institute of Nuclear Power Operations

Collective Radiation Exposure Performance and Industry Performance Trends

2012 ISOE ALARA Symposium

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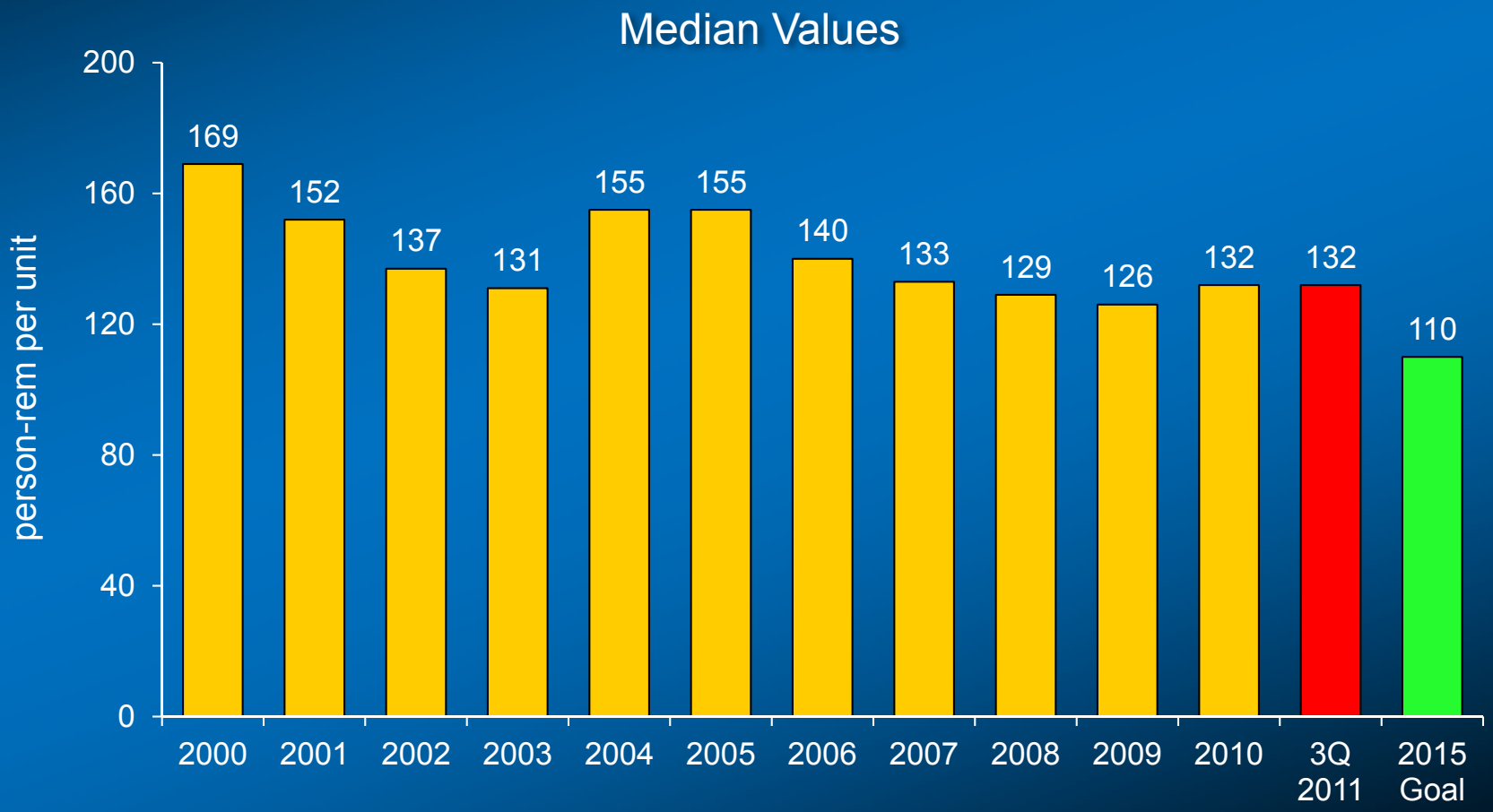
Key Topics

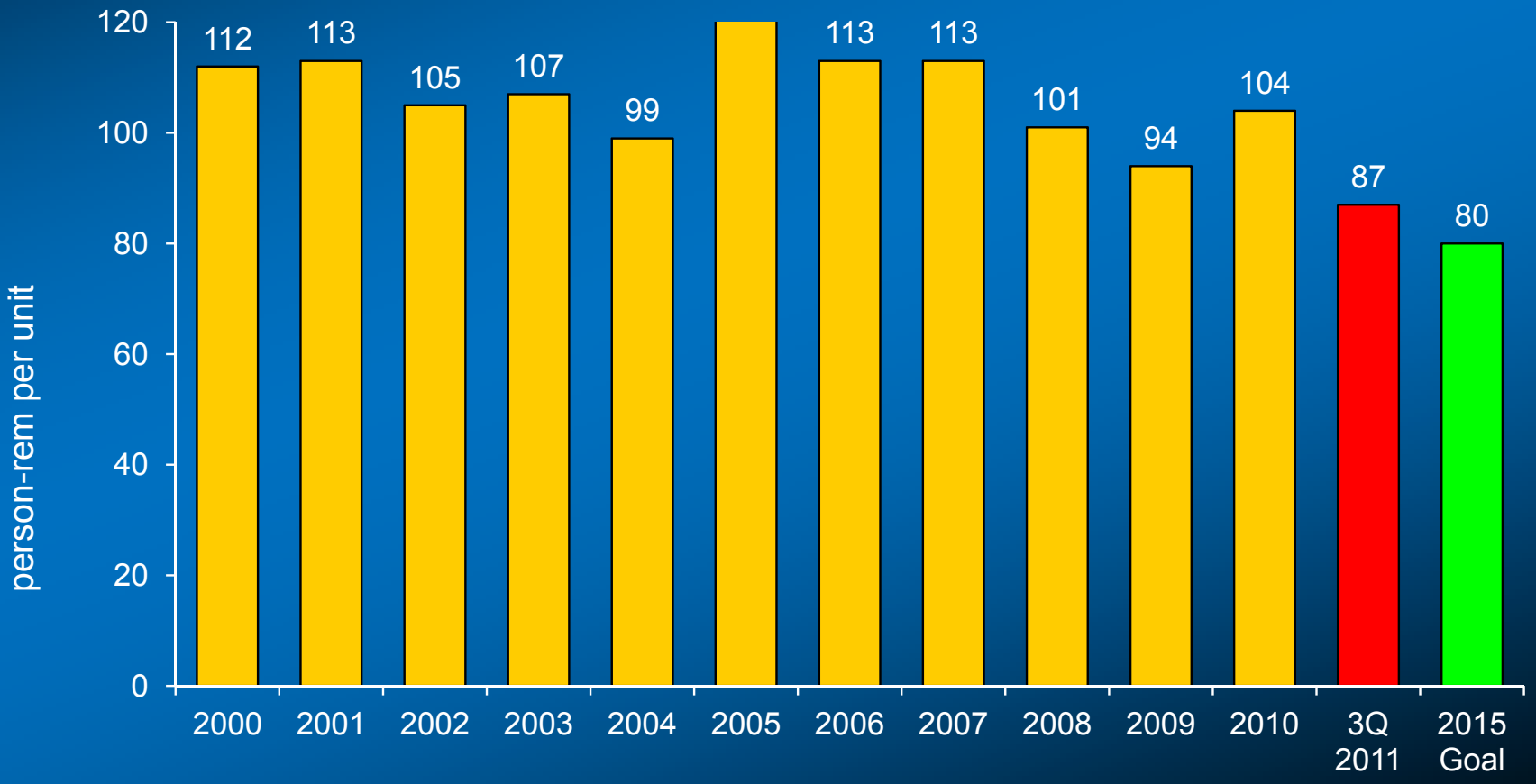
- CRE Performance Trends
- Important Recent Operating Experience
- 2011 Evaluation Trends of Concern
- Looking Ahead to 2012 and Beyond
- Closing Message

U.S. Collective Radiation Exposure (BWR)

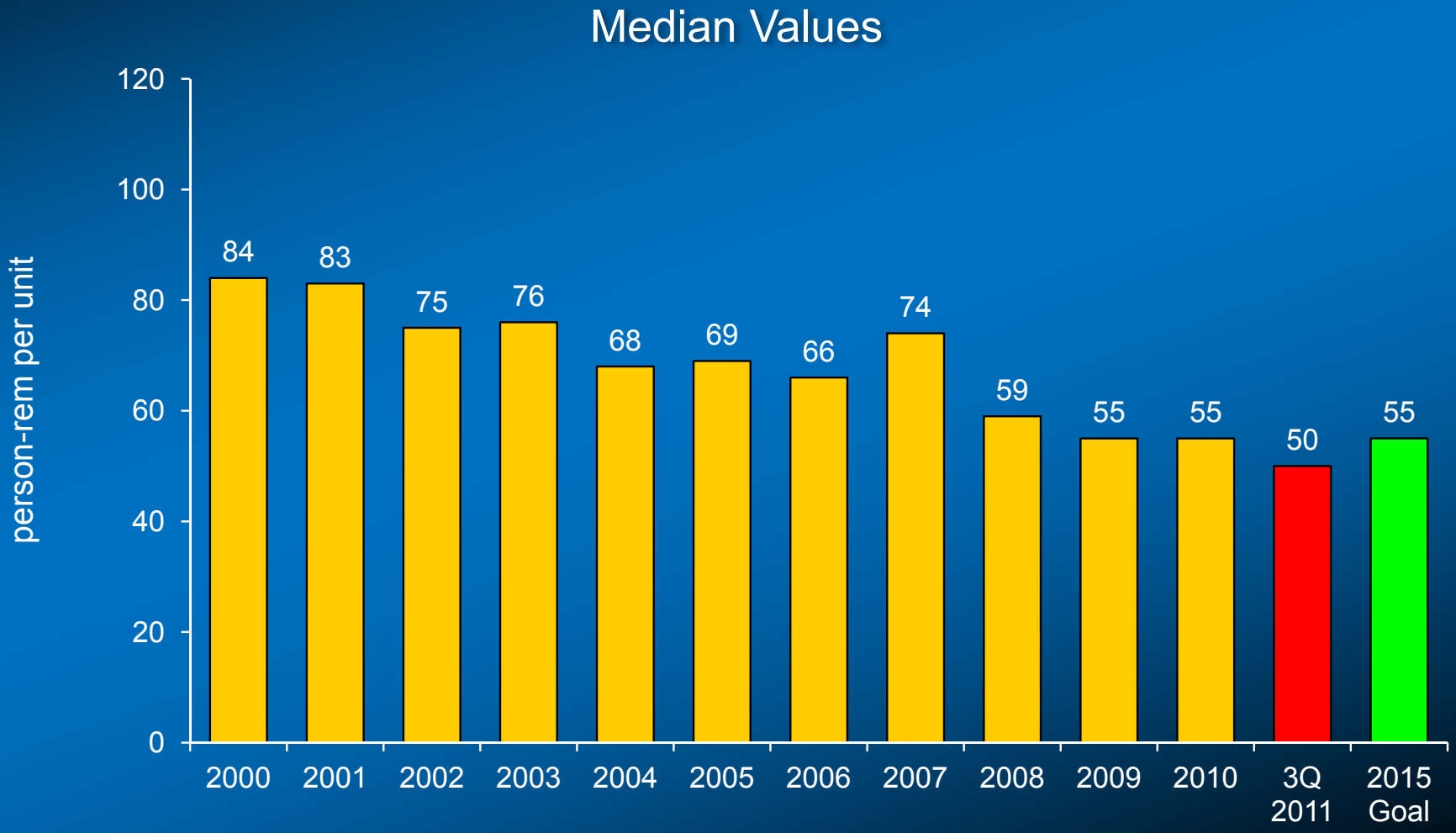


World Collective Radiation Exposure (PHWR)

Three-year Median Values



U.S. Collective Radiation Exposure (PWR)



Important Recent Operating Experience

CRE INPO Event Report (IER) Level 2, 11-1

- CRE Performance Improvement Inadequate
- US BWR fleet did not make goal in 2010 or 2011
- US PWR fleet did make goal in 2010 and 2011 but..
- Causes for not making goal
  - High Source Term
  - Outage Planning and Execution Shortfalls

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INPO Event Report (IER) Level 2, 11-1

- Industry Lessons Learned
- Senior Management provides oversight and resources that support dose reduction plans
- Dose reduction initiatives to reduce source term are funded and scheduled
- Outage schedules include activities and contingencies to manage crud releases and implement dose reduction initiatives

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INPO Actions

- Empanel an industry volunteer team to evaluate station IER response/action plans and provide specific feedback
- Evaluate progress on the actions during INPO Evaluations and WANO Peer Reviews
- Provide assistance as requested

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Important Recent Operating Experience

- OE 33459 – Unexpected Radiation Levels Encountered During Removal of Source Range Monitor Detector
- OE 33403 – Dose Rate Alarms Received by Workers Undervessel
- OE 32787 – A Highly Activated Object in the Dryer/Separator Pit was not Addressed in a Timely Manner
- OE 33802 – Unauthorized Issuance of a Locked High Radiation Area Key

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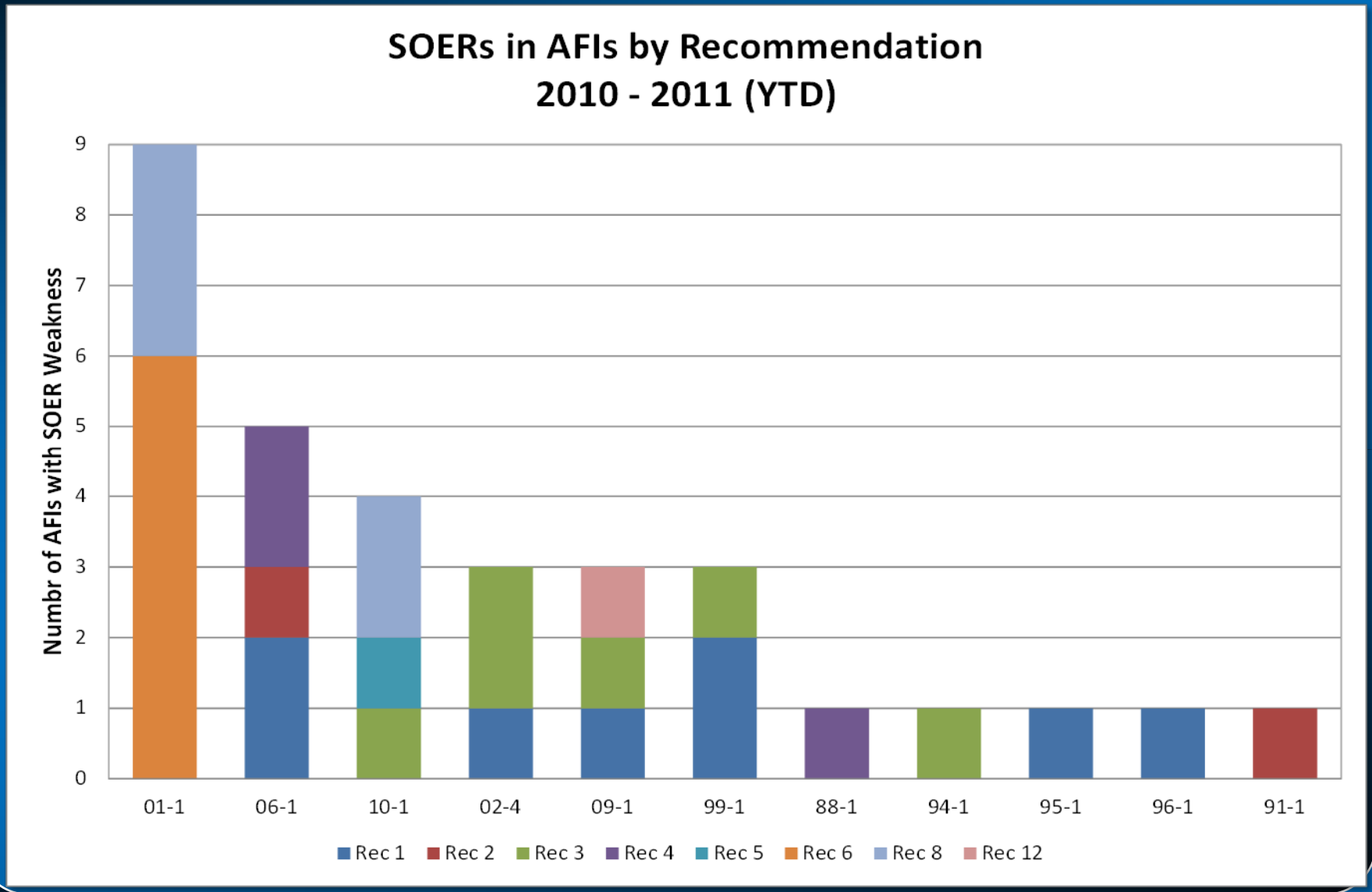
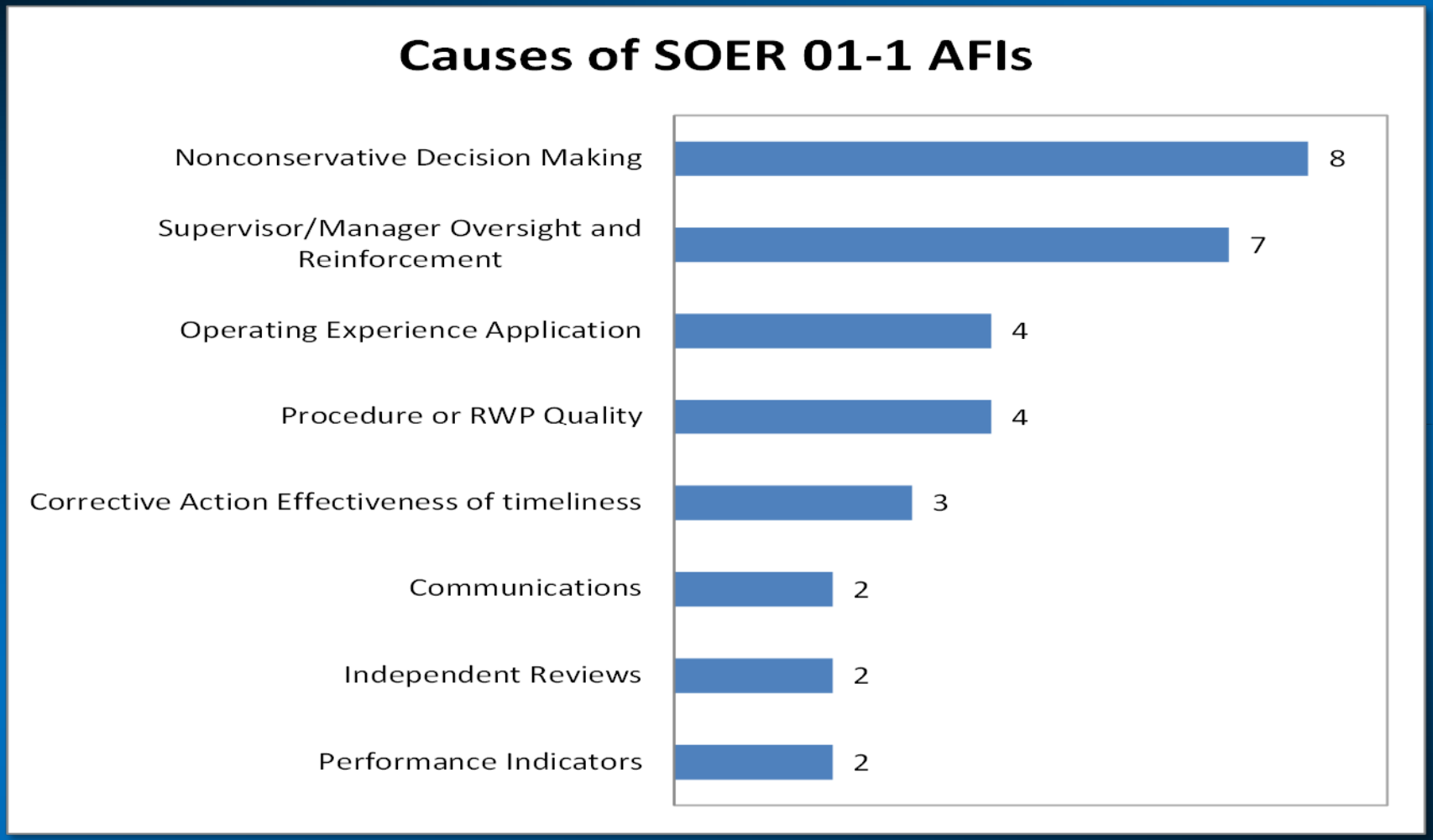
2010-2011 Events Tied to SOER 01-1



2011 Events Tie to SOER 01-1



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Important Recent Operating Experience

- OE 33659 - Area Evacuated for Potential Airborne Activity not Controlled for Approximately 15 Minutes
- OE 33012 - Airborne Radioactivity on the Refuel Floor Results in Personnel Contaminations and Intakes
- OE 33431 - Unrecognized Alpha Contamination Levels may have Resulted in an Unplanned Internal Contamination to Affected Personnel
- OE 34763 Multiple Alpha Intakes During Pipe Preparation Following Valve Removal

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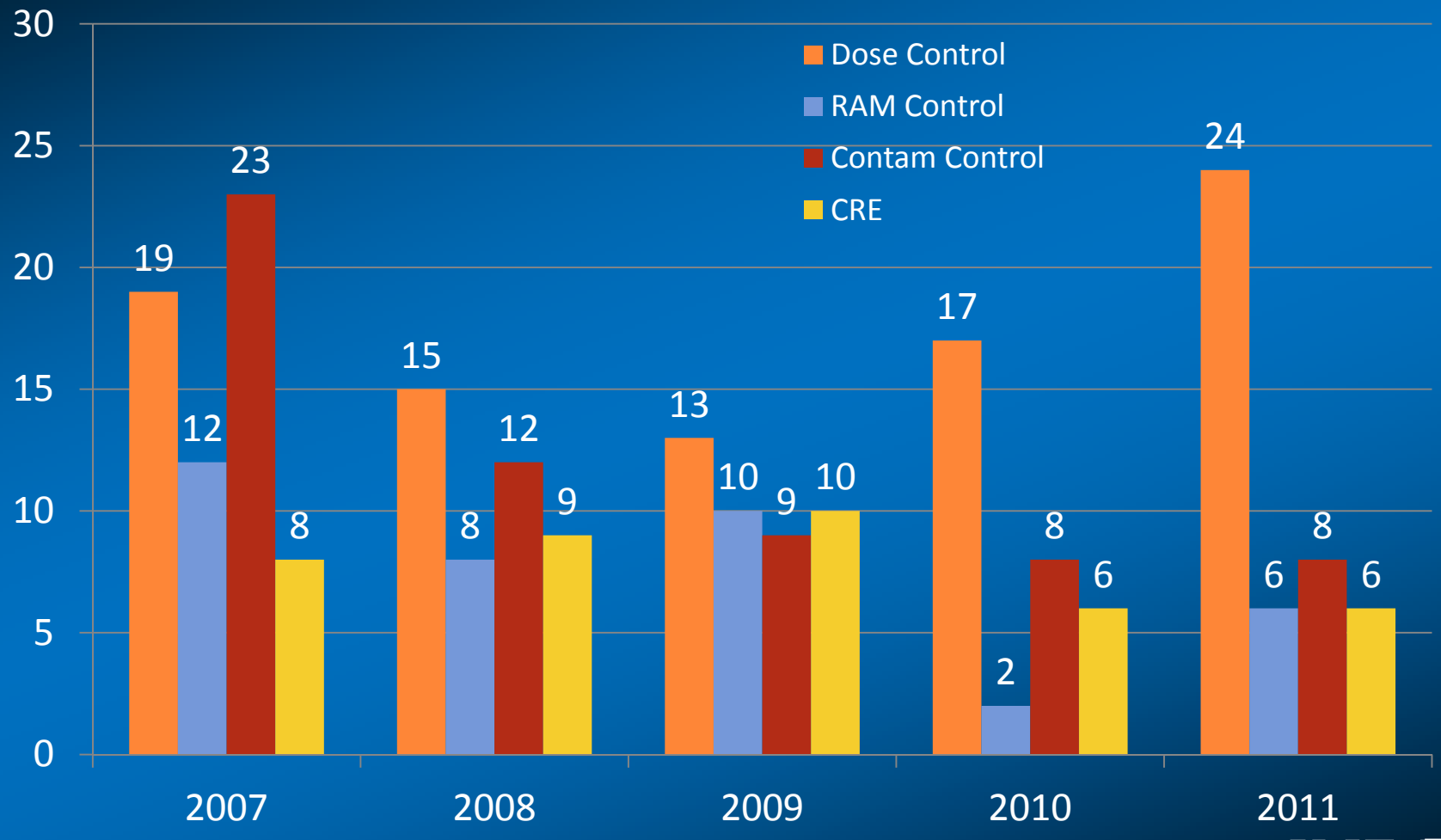
2011 Evaluation

Trends of Concern

Evaluation Trends



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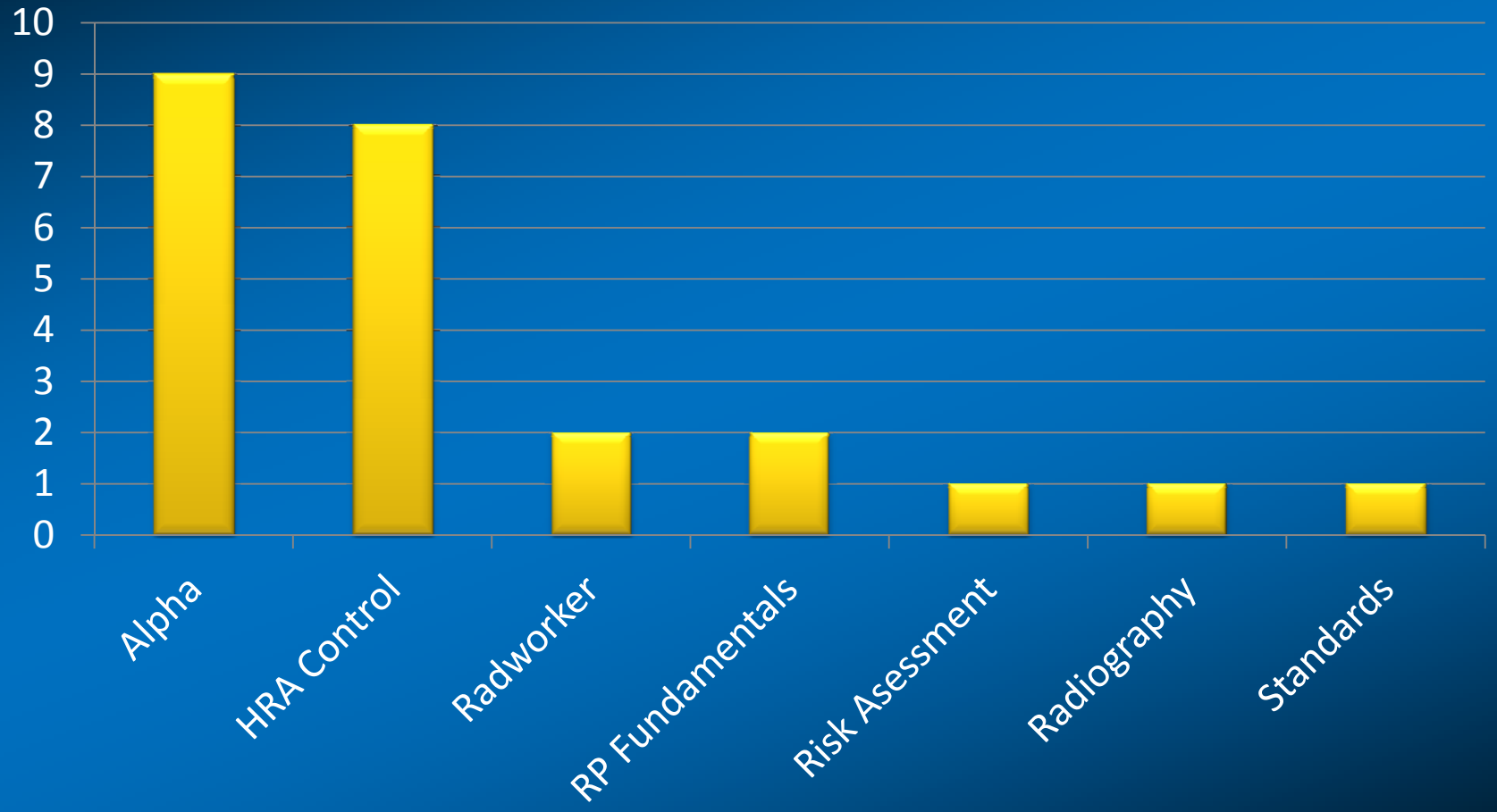
2011 Dose Control AFIs



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Recent Evaluation Trends

- Alpha Monitoring Concerns
  - Characterization data averaged rather than using work site/job specific
  - Facility alpha characterization based solely on waste data
  - Samples have too little activity or alpha MDA too high to demonstrate only minimal hazard (e.g.100K:10 dpm = 10,000:1 – level II area)
  - Smears not counted for alpha

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Recent Evaluation Trends

- Alpha Monitoring Concerns
  - No provision/procedures for excreta collection
  - Smears of smears – sample cutting result in assumed transfer efficiency or counting efficiency (have seen 1/32 of a smear?)
  - Bγ:α Ratio not determined/significance not recognized
  - RP personnel not well versed in alpha fundamentals (e.g., Am-241 not recognized)

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Recent Evaluation Trends

- Alpha Monitoring Concerns
  - Personal air samplers not available/used in level III areas
  - Self absorption not accounted for in analysis
  - RWPs do not specify stop-work criteria for alpha
  - RP personnel not familiar with significance – what does 3000:1 mean?

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2012 and Beyond –

"BIG"- RP

- **Mission:**
  - Engaging all nuclear power work groups and workers to achieve collective and individual radiation exposure goals and elimination of radiological events

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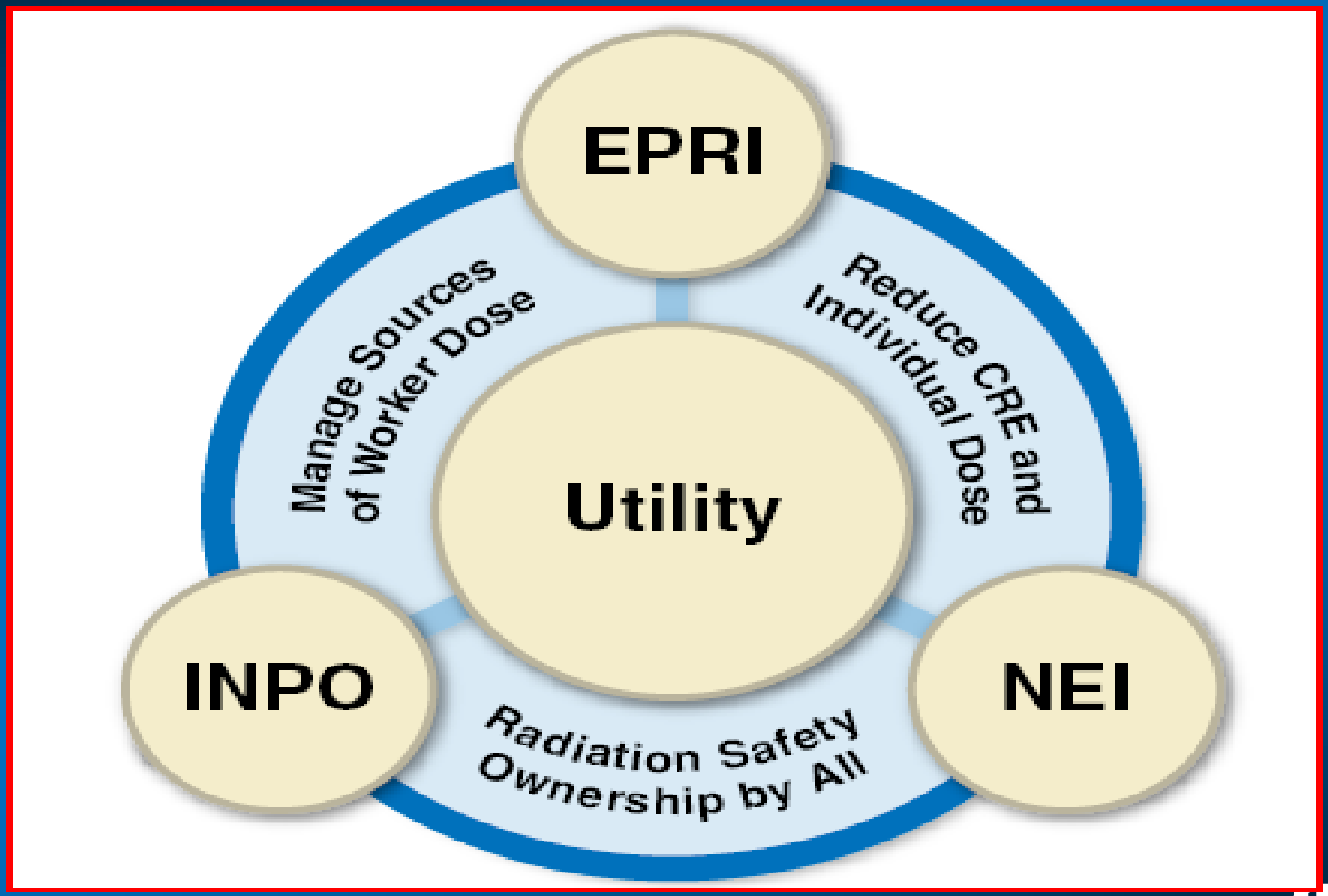
2012 and Beyond – "BIG"- RP



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2012 and Beyond

- Revise Performance Objectives and Criteria
- IER Review and Follow-up
  - IER L2-11-1, CRE
  - IER L2-11-41, Undervessel Events
- Big RP
- Best Practices Development
- RP Specific Fundamentals

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Future Meetings

- INPO Alpha Monitoring Webcast
  - January 25, 2012 1 p.m. EST
- RPM Working / Technical Meetings
  - April 10-12, 2012
  - November 6-8, 2012
- New Radiation Protection Managers Workshop
  - December 4-6, 2012

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Closing Message

- We must eliminate events - Recent OEs show vulnerability for significant consequences.
- How?
- Demonstrate:
  - Engaged, Thinking RP Organization - RP involvement in work planning, scheduling and execution
  - Effective communication
  - Robust and diverse barriers and controls

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Closing Message

- Demonstrate:
  - Sound radiological hazard level assessment – what can go wrong? – how bad can it get? - how will we prevent it?
  - Conservative decision making.
  - Critical radiological controls and requirements in writing – in the controlling document (RWP, etc)

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Questions & Comments