

# **INPO**

*Institute of Nuclear Power Operations*

***INPO Update -***

**2015 North American ISOE  
ALARA Symposium**

**January 12, 2015**

Kevin Pushee

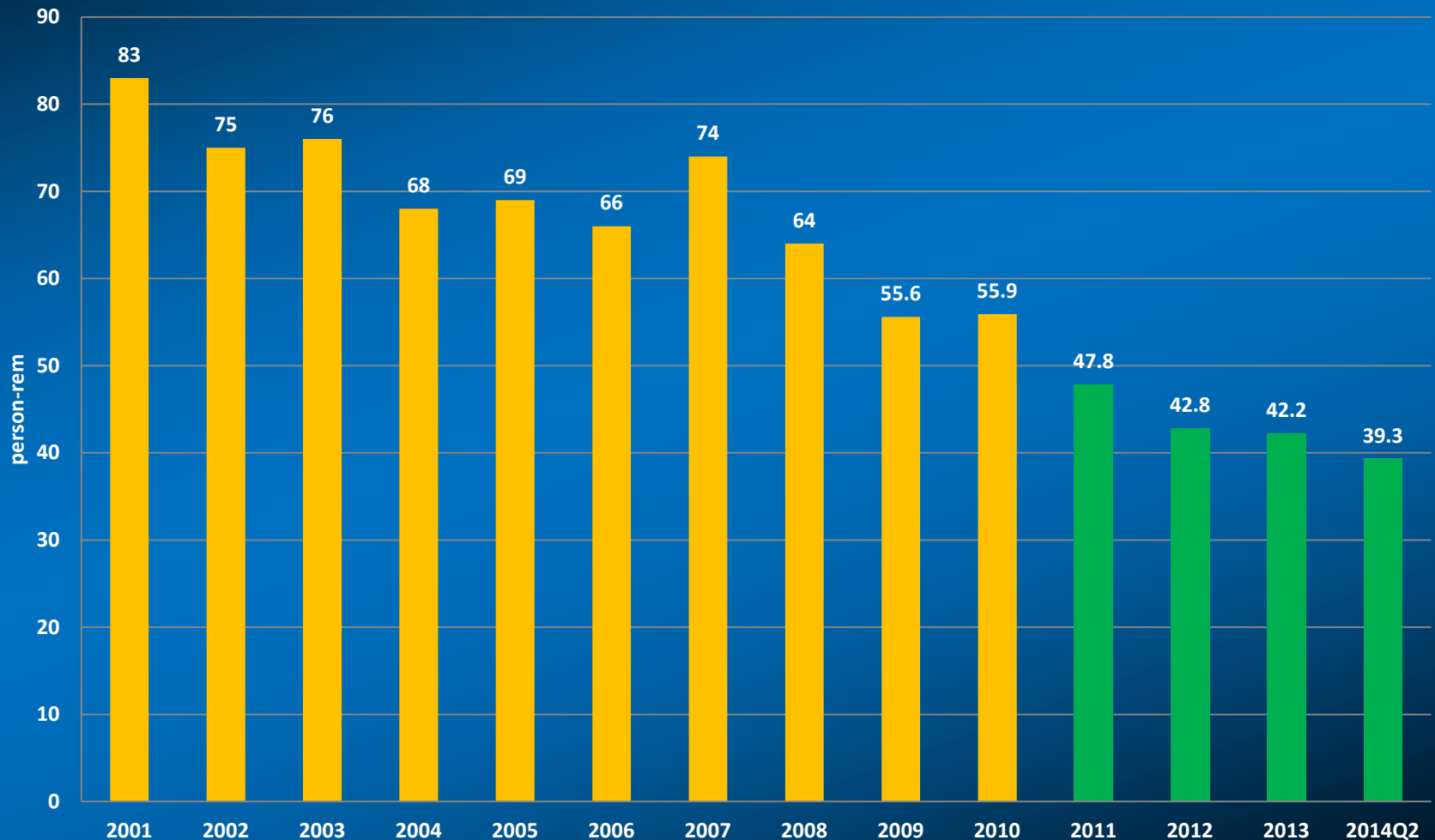
INPO Radiation Protection Manager

# Key Topics

- 2014 Industry Focus Areas:
  - CRE Reduction
  - HRA / LHRA Controls and Prevention of Unplanned Exposures
  - RP Fundamentals
- Summary of Industry Performance
- *What's Coming Your Way-*  
INPO and “Big RP” Initiatives
- Performance Monitoring and Recovery

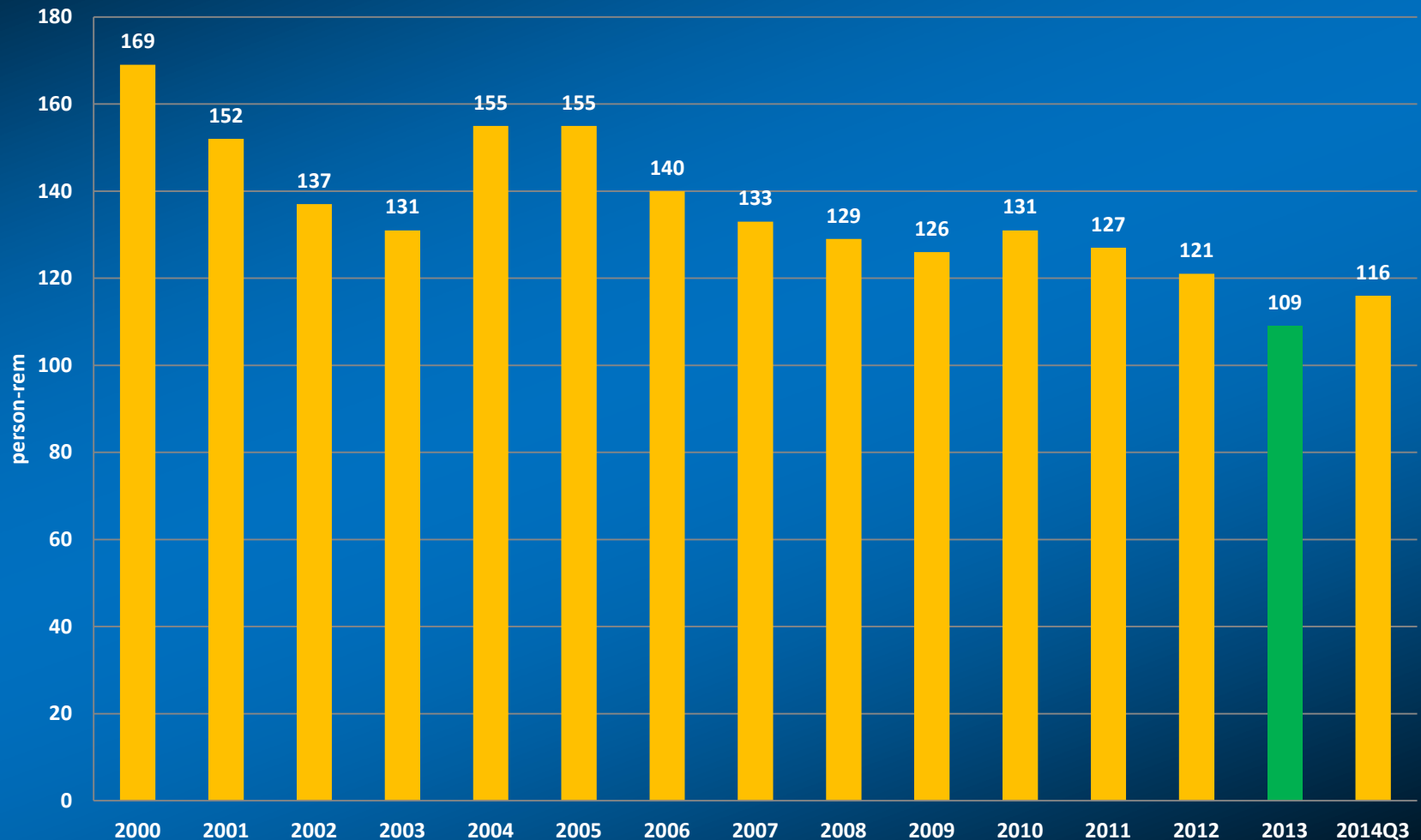
# PWR CRE Reduction

U.S. Collective Radiation Exposure (PWR)  
Median Values 2014



# CRE Reduction

U.S. Collective Radiation Exposure (BWR)  
Median Values 2014

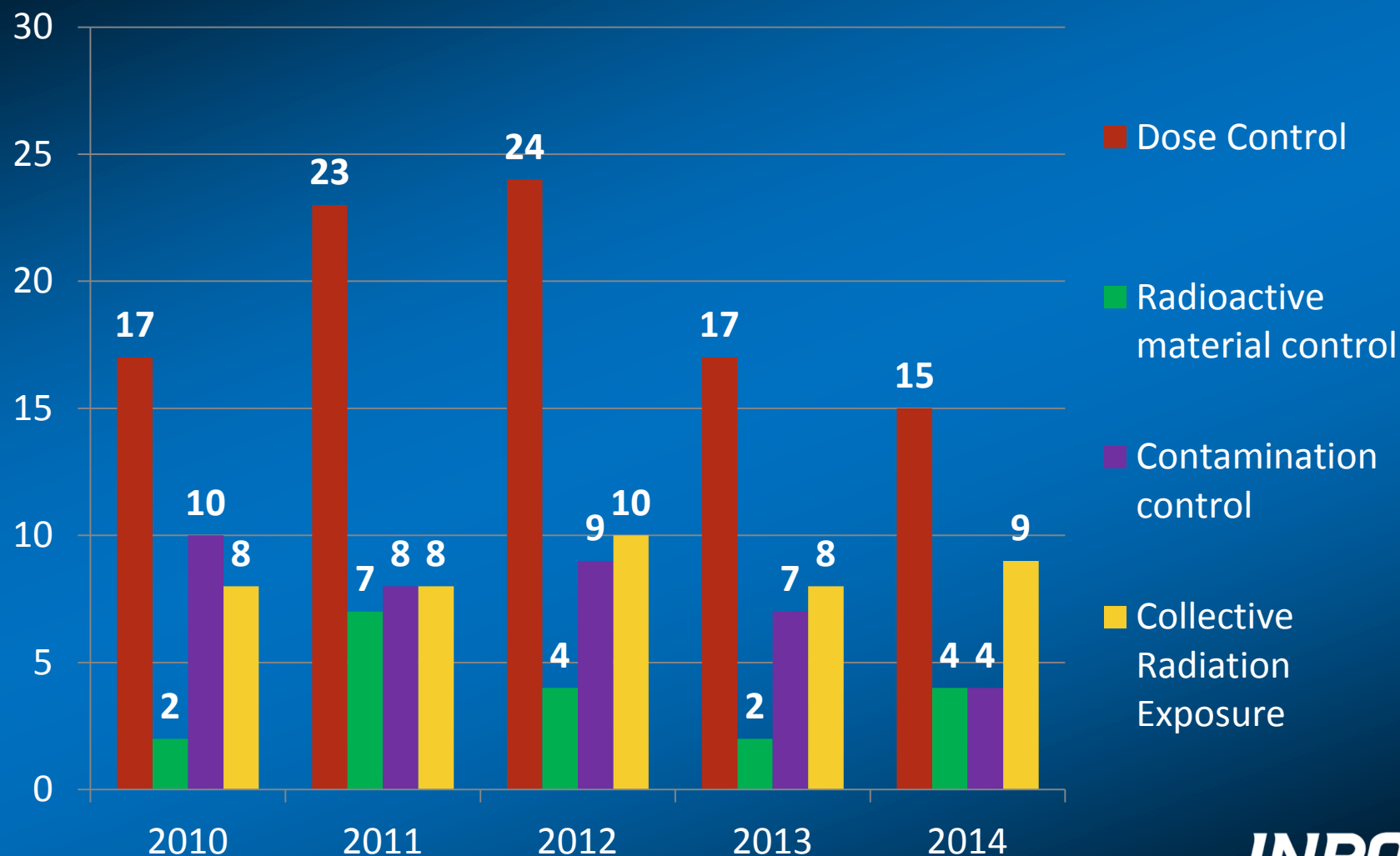


# BWR CRE Progress- 3rd Qtr 2014

## BWR Collective Radiation Exposure Median Person-Rem



# RP and RS AFIs Through 2014



# Summary of AFIs: Collective Radiation Exposure

## Principal Causes and Contributors to AFIs:

- Long-range dose reduction plans not effective; four of nine 2014 AFIs reveal weaknesses in implementing IER L2-11-1, *Inadequate Collective Radiation Exposure Improvements*:
  - Industry benchmarking not performed to identify best initiatives to reduce dose
  - Initiatives in long-range ALARA plans do not support (mathematically) RFO and annual dose goals
  - Initiatives lack owners, timely due dates, and funding
  - Senior managers / ALARA committee do not appropriately prioritize or support ALARA initiative implementation:
    - Low-value initiatives pursued that have minimal benefit to CRE improvement
    - Resources not allocated to support initiatives





# Summary of AFIs: Collective Radiation Exposure *Cont.*

## Principal Causes and Contributors to AFIs:

- Outage ALARA plans lack effective initiatives to reduce dose:
  - Shutdown water management plans not effective: RP / CY / Ops not developing sound strategies to manage source term
  - ALARA personnel / Outage HIT teams: benchmarking not performed to identify best strategies for reducing dose
  - ALARA Committees do not provide critical reviews / challenge of ALARA plan content
    - AC members not proficient in questioning / challenging ALARA plans
- Work In-progress reviews not effective in identifying and correcting adverse CRE performance
  - ALARA personnel not in the field observing (and coaching)
  - Performance gaps not trended / entered into CAP
  - ALARA personnel assigned collateral outage duties





# Summary of AFIs: HRA Controls / Prevention of Unplanned Exposure Events

## Principal Causes and Contributors to AFIs:

- RP Technicians do not apply appropriate fundamentals:
  - Rationalize why it's acceptable to deviate from HRA control requirements
  - Complexity of the activity is downplayed
  - Overconfidence: Activity performed in the past without problems
- Managers do not establish or enforce effective HRA control standards:
  - Some managers not familiar with best industry HRA control standards
    - Limited benchmarking / attendance at industry meetings
  - Minimal oversight of critical / high-risk work
  - Coaching is not critical; technician and worker behaviors not corrected
- RP technician performance not tracked / trended:
  - Missed training opportunities close performance gaps



# Summary of AFIs: HRA Controls / Prevention of Unplanned Exposure Events *Cont.*

## Principal Causes and Contributors to AFIs:

- Gaps in the implementation of IER L2-11-41: *Controlling Work Associated with NI & Irradiated hardware*
  - Radiological hold points, critical steps, stop work criteria not identified in procedures or work orders
  - Two 2014 AFIs: stop work criteria ( max dose rates) were defined in procedures, but not effectively enforced by RP nor followed by workers . In one case, an individual worked through a dose rate alarm  $> 1000$  mrem and received  $\sim 65$  mrem of unplanned dose



# Summary of AFIs: Radioactive Material Control

Four RAM AFIs in 2014 -

## Principal Causes and Contributors to AFIs:

- Weaknesses in controlling temporary / satellite RCAs
  - RP and Workers not removing RAM tools from RCA prior to down posting areas
- Large number of RAM tools stored in uncontrolled areas within RCA
  - Lockers and unlocked tool boxes
  - Hidden in alcoves for later use (not returned to tool room)
- Equipment with fixed contamination stored in outdoor RCAs; not placed in weatherproof containers



# Industry Performance and Trends (PIC Data)

## Total HRA Events: **Green**- Favorable Trend

Total High Radiation Area Controls

Current Color **G** Green

☒ Total High Rad Area Controls



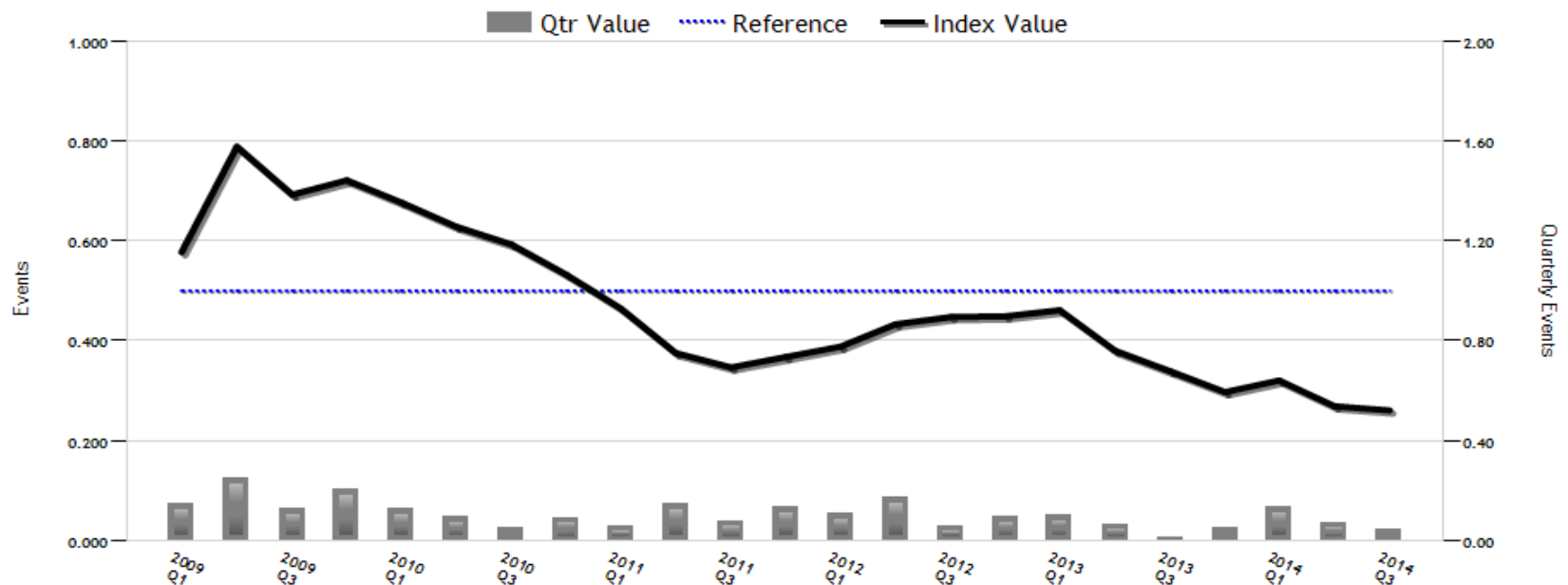
Current Trend Flat trend last year and better than the Reference

Data Date 11/13/2014

☒ Performance Graph



☒ Overlay Options: No overlays currently selected



# Industry Performance and Trends (PIC Data)

## NEI 99-02 HRA Events: **Green**- Favorable Trend

The number of Technical Specification High Radiation Area Occurrences reported to the NRC during a specific period of time.


**Current Color** G Green

**Current Trend** Much better than the Reference


**Data Date** 11/16/2014

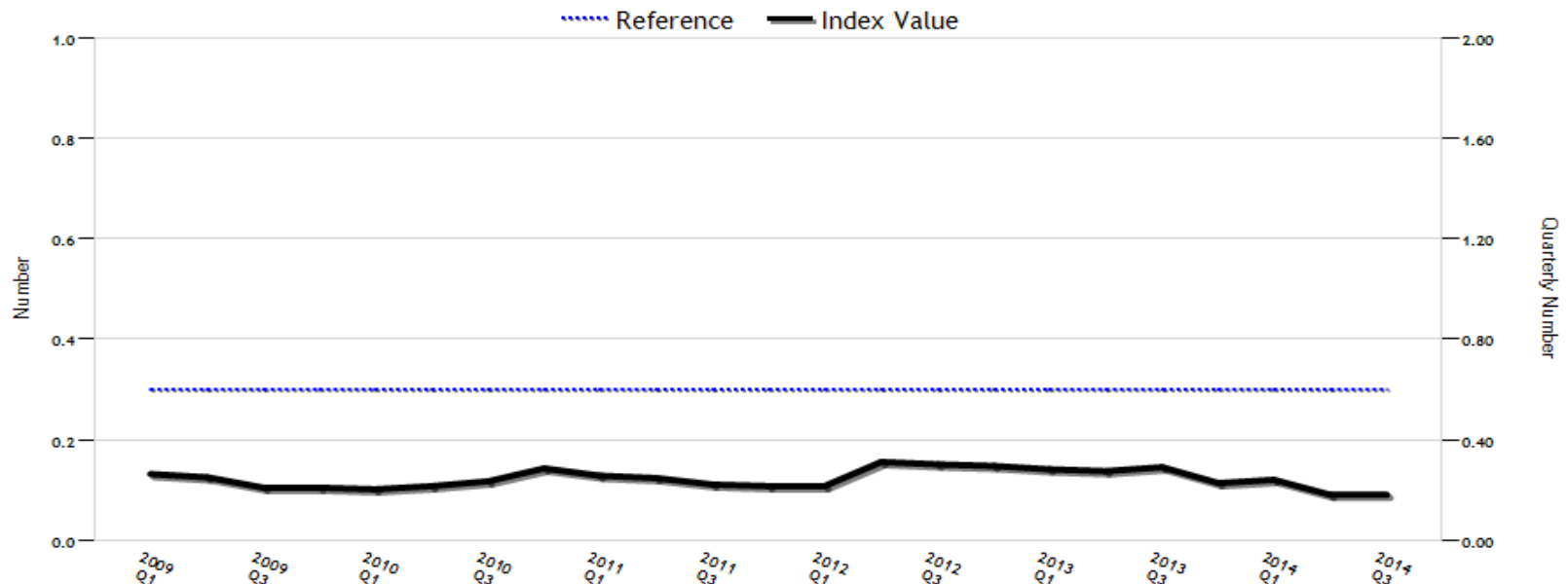
TS High Rad Area Occur



 Performance Graph



 **Overlay Options:** No overlays currently selected

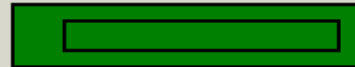


# Industry Performance and Trends (PIC Data)

## RCA / PA RAM Events: **Green**- Favorable Trend

Total Radioactive Material Control


☒ Total Rad Mat Control



Current Color **G** Green

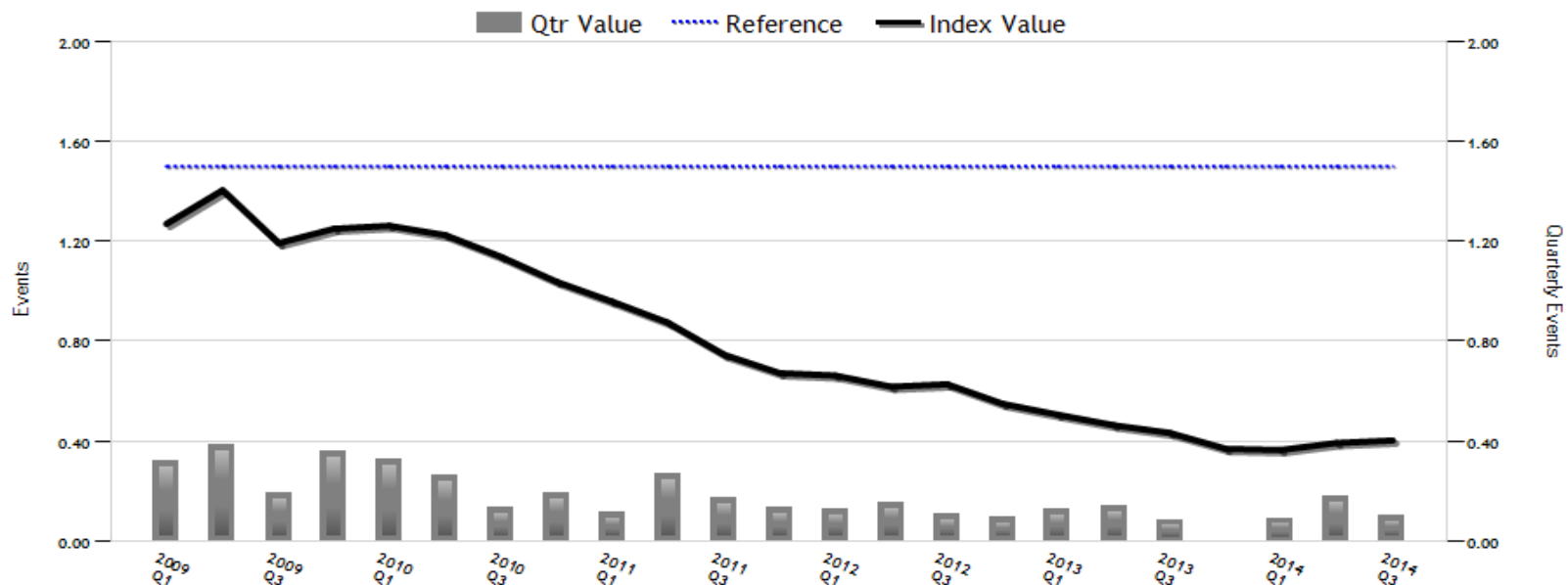
Current Trend Flat trend last 2 years and better than the Reference

Data Date 11/16/2014

 Performance Graph



☒ Overlay Options: No overlays currently selected





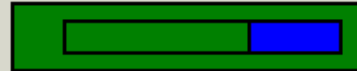
# Industry Performance and Trends (PIC Data)

## PCEs **Green**- Favorable Trend

Total Contaminated Personnel

Current Color **G** Green

☒ Total Contam Pers.



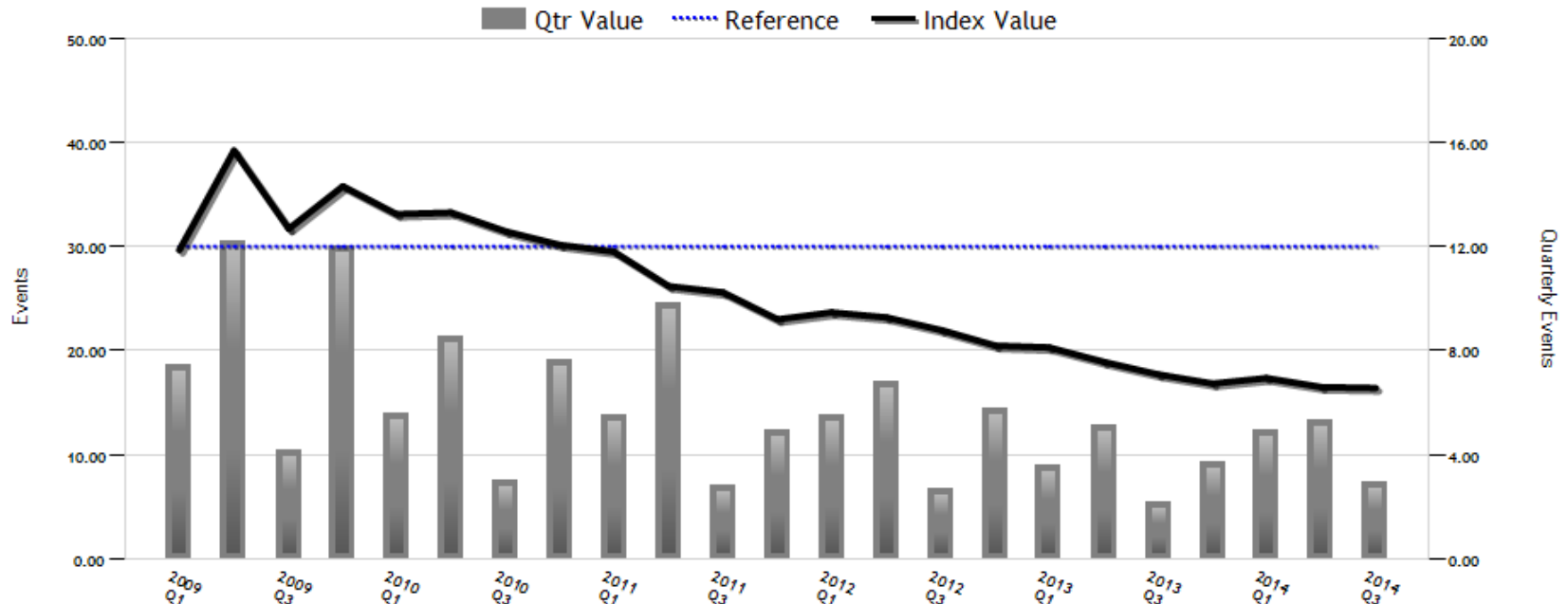
Current Trend Much better than the Reference

Data Date 10/28/2014

☒ Performance Graph



☒ Overlay Options: No overlays currently selected





# What's Coming Your Way - “The Big RP” and INPO Initiatives

- NANTeL Alpha Contamination monitoring and control training for industry RP technicians. *(Complete Oct. 2014 - INPO / Industry / EPRI)*
- NUF RP Technician Exam Question Bank has been updated on NANTeL *(Complete Oct 2014 - INPO / Industry)*
- Develop NANTeL CBT training modules to support updated NUF exam questions *(INPO / Industry: 2015 Project , Due Date TBD)*

*Note: Training modules are on NANTeL and can be downloaded printed*

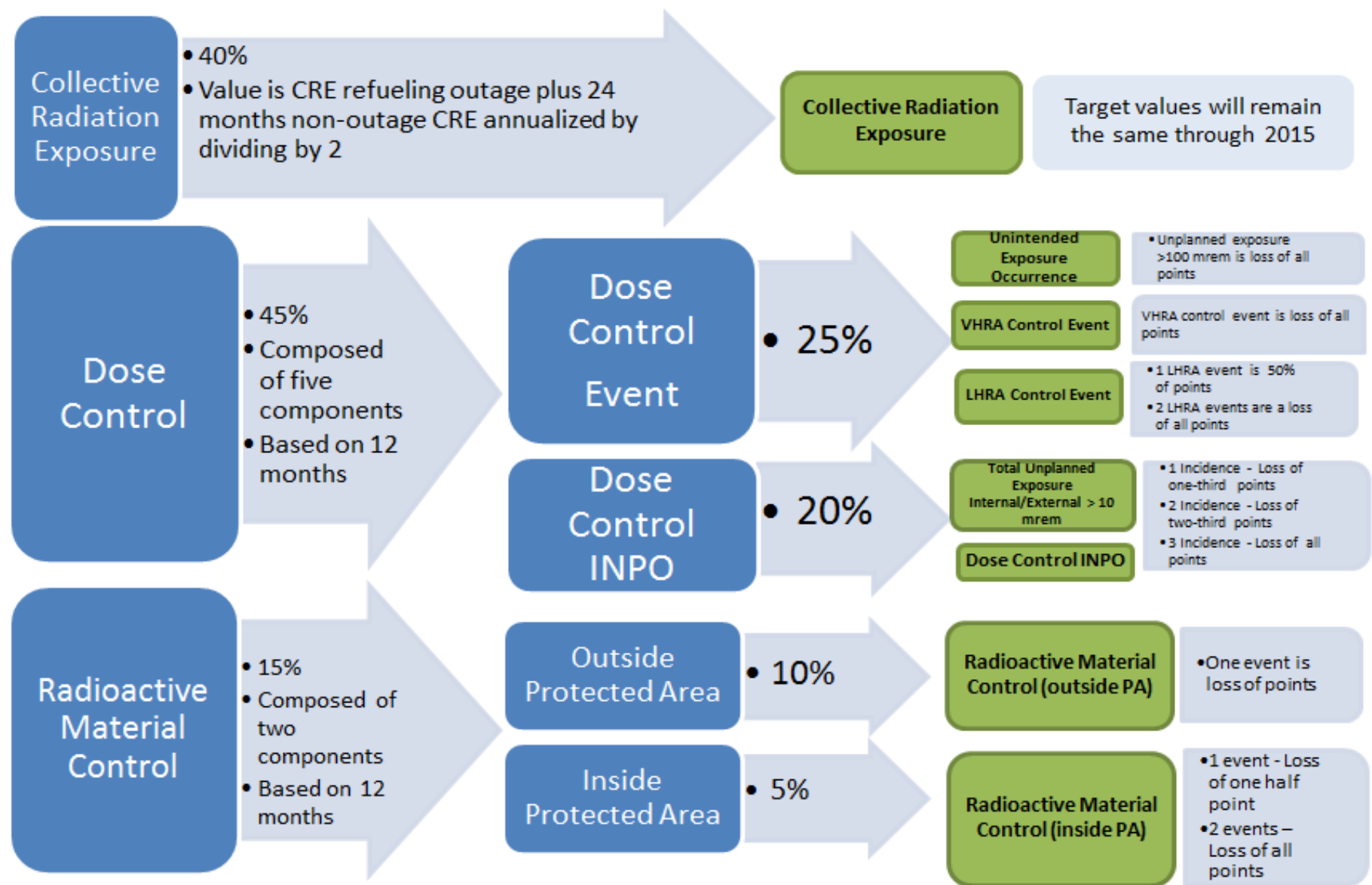


# What's Coming Your Way - “The Big RP” and INPO Initiatives

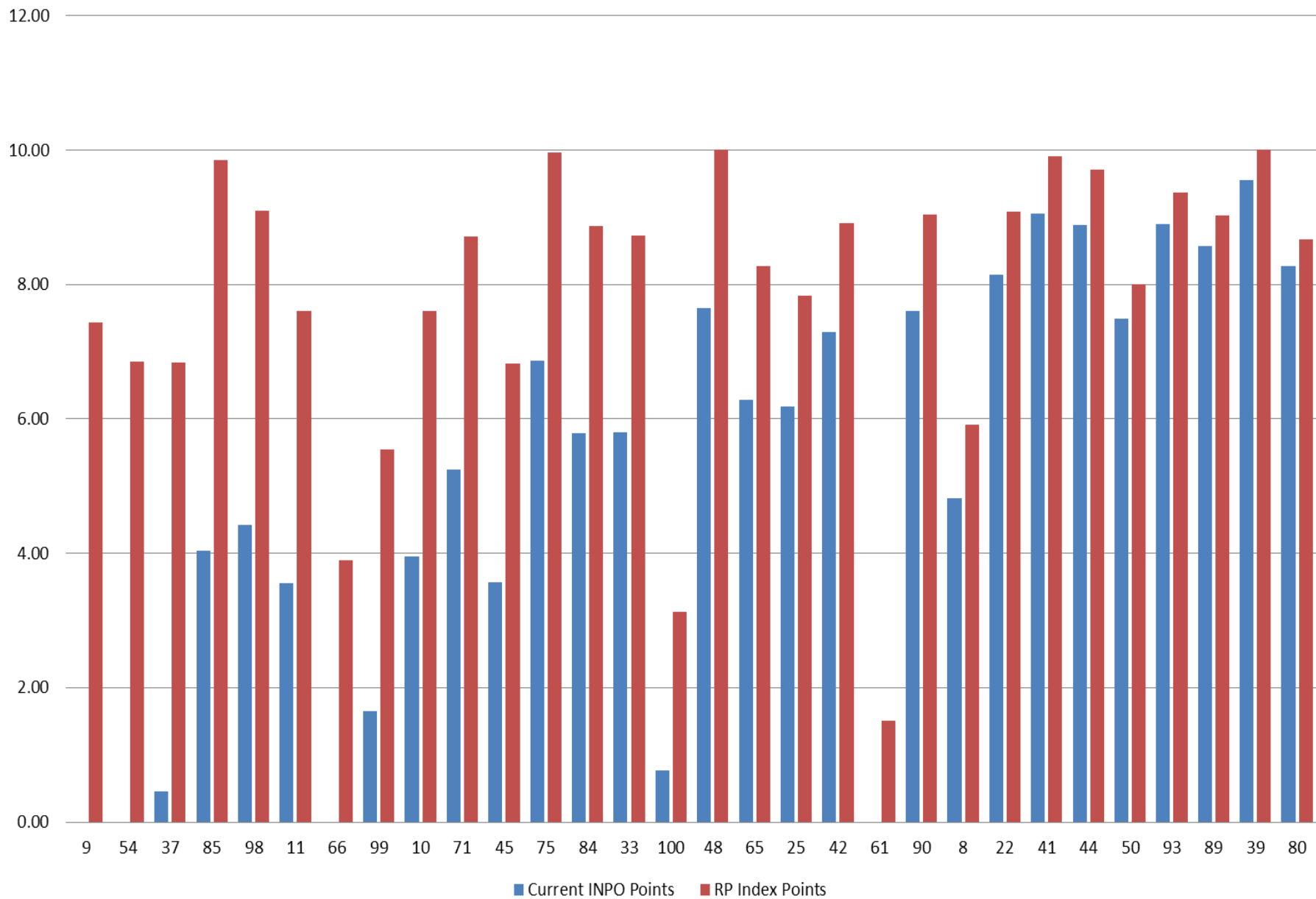
- Piloting of the proposed 2020 Industry Radiation Protection Indicator is underway
- Reports of the piloted indicator will be distributed to the industry each quarter



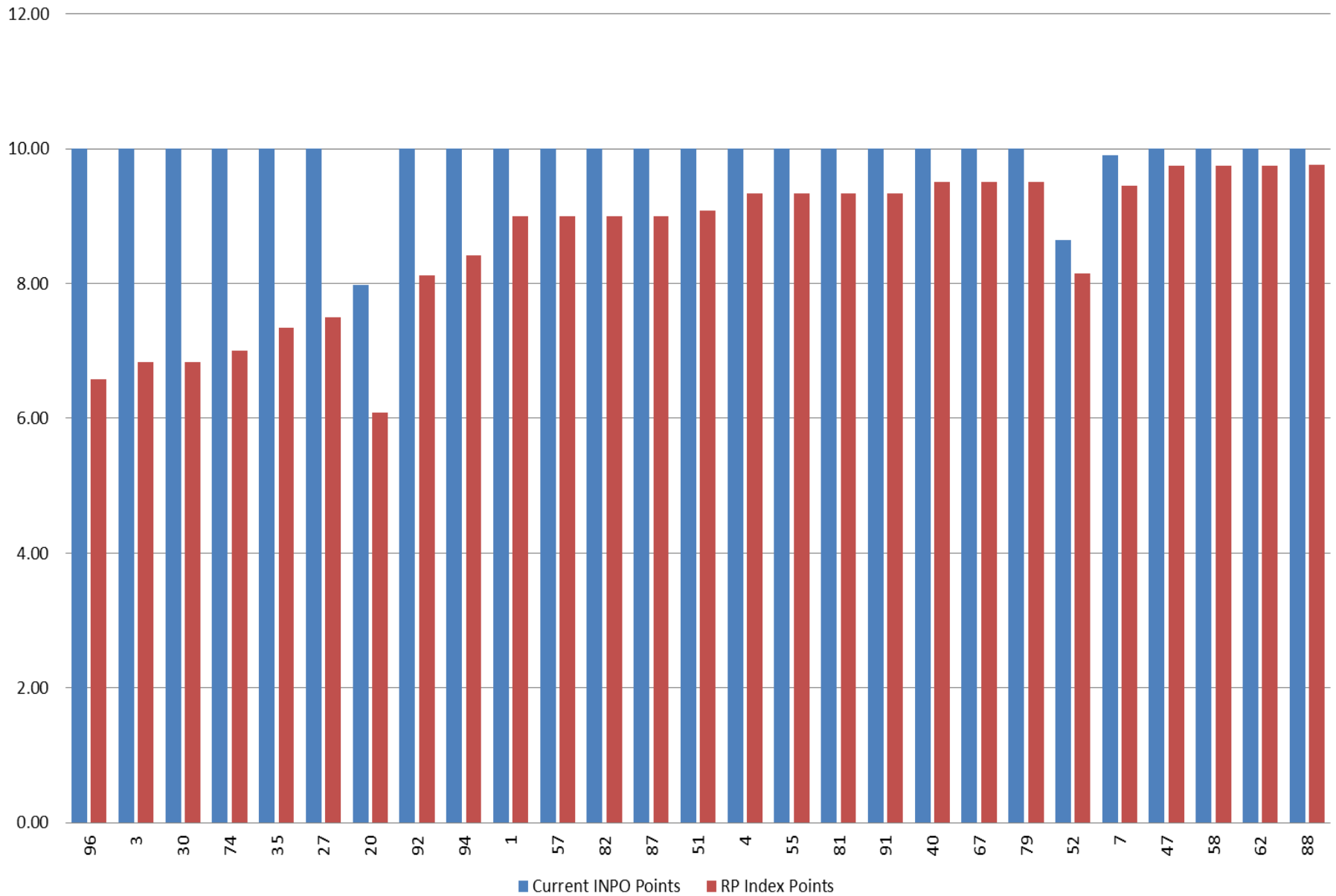
# Illustration of Pilot Radiological Performance Indicator



## 2014 3rd Qtr: Plants That Gained Points



## 2014 3rd Qtr: Units That Lost Points

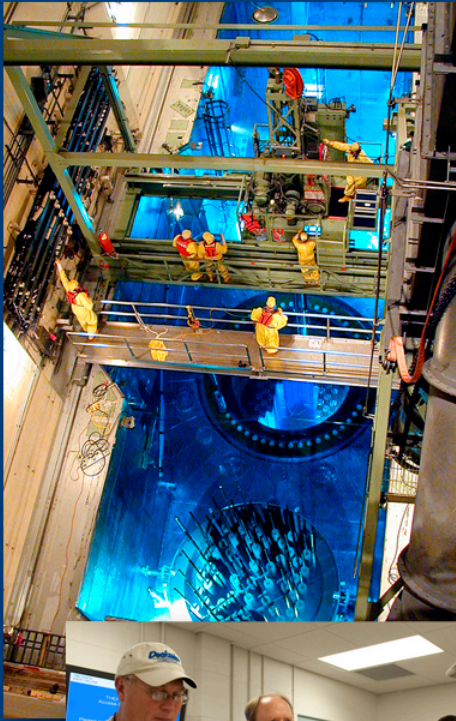


# 2020 Pilot RP Indicator- Summary through 2014 3<sup>rd</sup> Qtr:

- 31 percent of units gained a median of 2.4 points
- 28 percent of units lost a median of 1.0 points
- Indicator results will be updated again in Feb 2015 using industry data through 2014 4th Qtr.





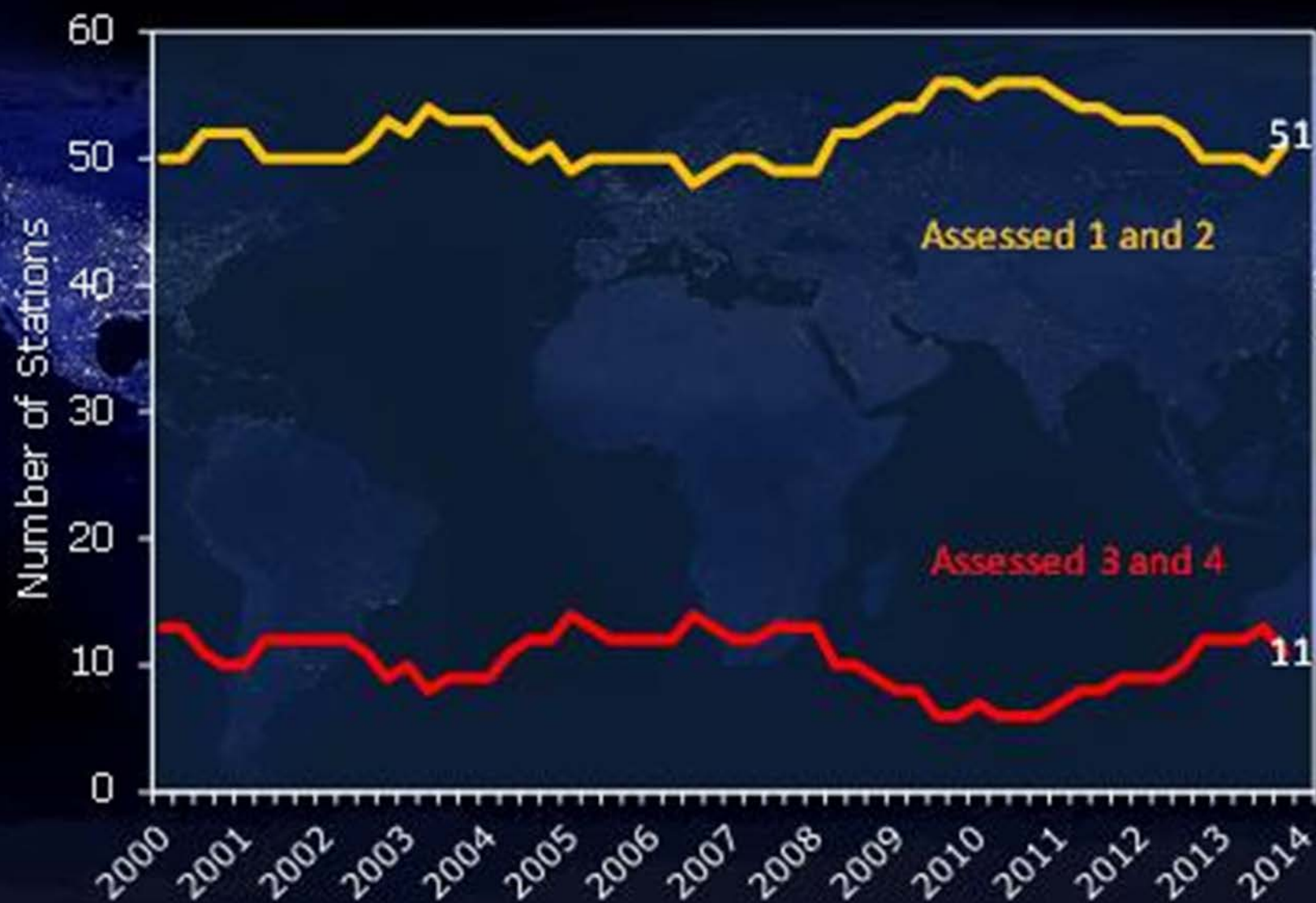


# Performance Recovery, Performance Monitoring, and Assistance

**INPO<sup>®</sup>**



# Assessment Trends



# 2023 End State

- All stations achieve industry goals staying within 1-2 bandwidth, occasional 3's
- Repeated INPO 3 assessments are rare
- No assessments of 4 or 5
- No significant events
- No surprise decreased assessments
- Accreditation probations are rare



# First and Second INPO Priorities

- #1 – Performance Recovery
  - Improve the performance of stations assessed 3 and 4
- #2 – Performance Monitoring
  - Maintain the excellent and solid performance of stations assessed 1 and 2 respectively



# Performance Recovery Method

- All INPO 3's and 4's
  - Special Focus
  - Increased Involvement
- High Contact Time at Station
  - Functional Area Assistance (onsite)
  - PRL Visits
  - Special Focus Teams / Assist Visit Teams
- PRL Teams



# Performance Monitoring Method

- Monitor – Engage
  - Data Review / Trigger Points
  - Observations
  - Assistance
- Intervene
  - Elevate
  - Escalate



# Assistance

- Purpose is to develop solutions to known problems (not find new problems)
- Usually > 6 months before evaluations
- Use subject matter experts from INPO and the industry
- Typically ~150 technical assistance visits/yr
- Most stations receive 1 or 2 assists/yr
- Assistance methods and team make-up is tailored to the specific plant's needs



# Assistance

- Organizational effectiveness
  - Leadership, oversight, field observations
- Human performance
  - Operations, Maintenance, Rad Protection, etc.
- Equipment Reliability
  - EDGs, valves, circuit cards, transformers, etc.
- Programs / Processes
  - Radiation Protection, work management, safety tagging, outage planning, industrial safety, etc.





# Plant Evaluations – Piloting the Future Process

- RP - Usually one week on-site
- Observations of work may be augmented by increased attendance during RFOs / planned station evolutions
- No PDs or BPs
- Short and Long Form AFIs
  - Short: Generally narrowly focused issues / less consequential
  - Long: Generally more consequential issues/ performance shortfalls may be across multiple functional areas
- Second week focus on Leadership and Organizational Effectiveness



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## Questions & Comments