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Institute of Nuclear Power Operations

INPO Update:

2016 North American ISOE

ALARA Symposium

January 2016

Paul McNulty

INPO Radiation Protection Manager

Update Topics

- Industry Performance Summary:
 - U.S. Industry Performance
 - 2015 AFIs
 - New Evaluation Process
- Revision to 05-008
- 2020 RP Indicator

Radiological Protection 770-644-ext



Paul McNulty
Manager
Ext. 8021



Judy Merrow
Senior Administrative Assistant
Ext. 8439



Brad Mitchell
Principal Evaluator
Ext. 8346



Neal McKenney
Sr. Evaluator
Ext. 8309



Jim Twiggs
Sr. Evaluator
Ext. 8280



Jeff Foster
Sr. Evaluator
Ext. 8873



Terry Wilkerson
Sr. Evaluator
Ext. 8901



Greg Hackett
Sr. Evaluator
Ext. 8908



Walt Strodl
Sr. Evaluator
Ext. 8373



Tim Halliday
Sr. Evaluator
Ext. 8726



Mark Travis
Sr. Evaluator
Ext. 8263

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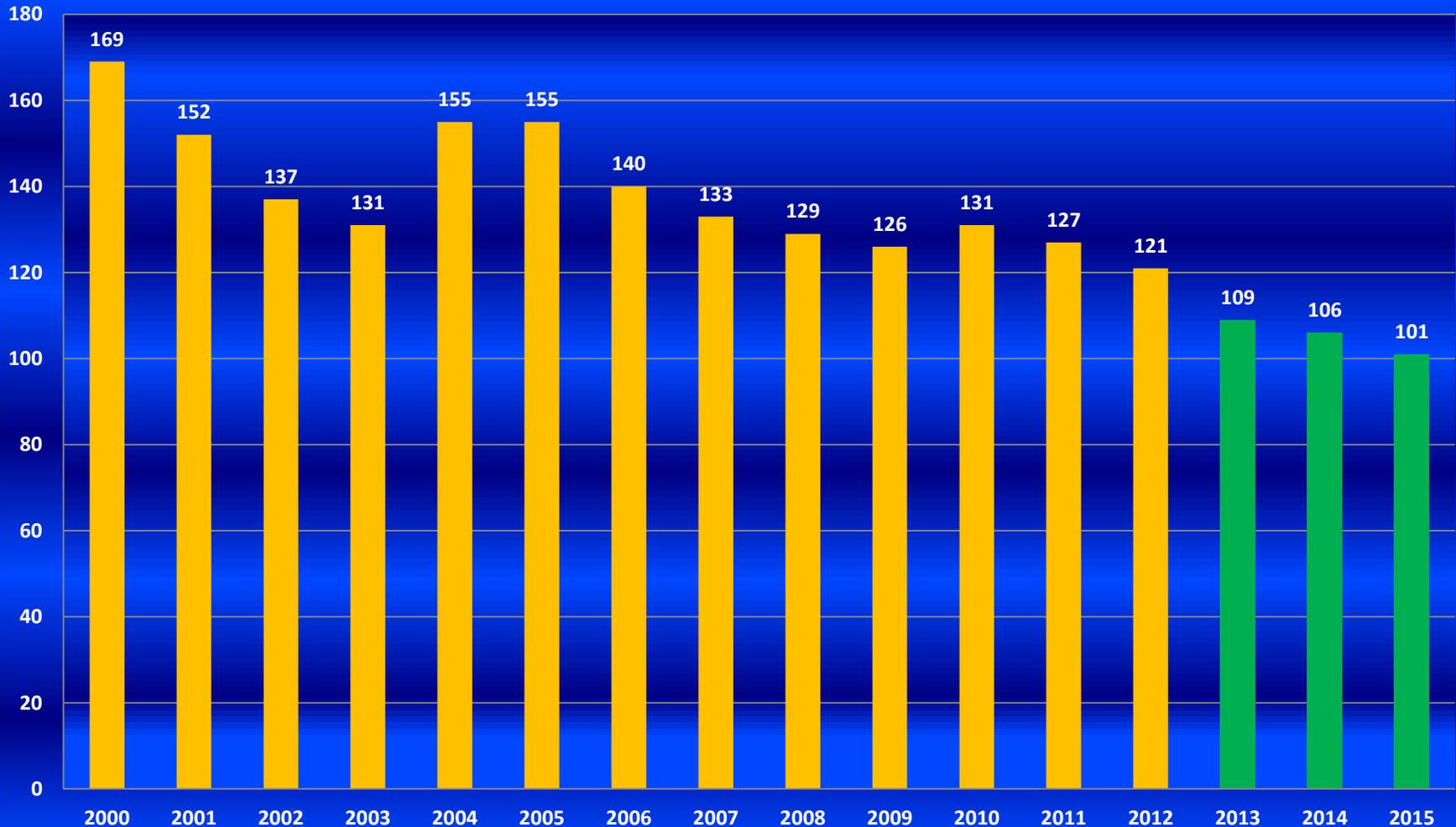
CRE Reduction

U.S. Collective Radiation Exposure (PWR)
Median Values – 3rd Quarter 2015

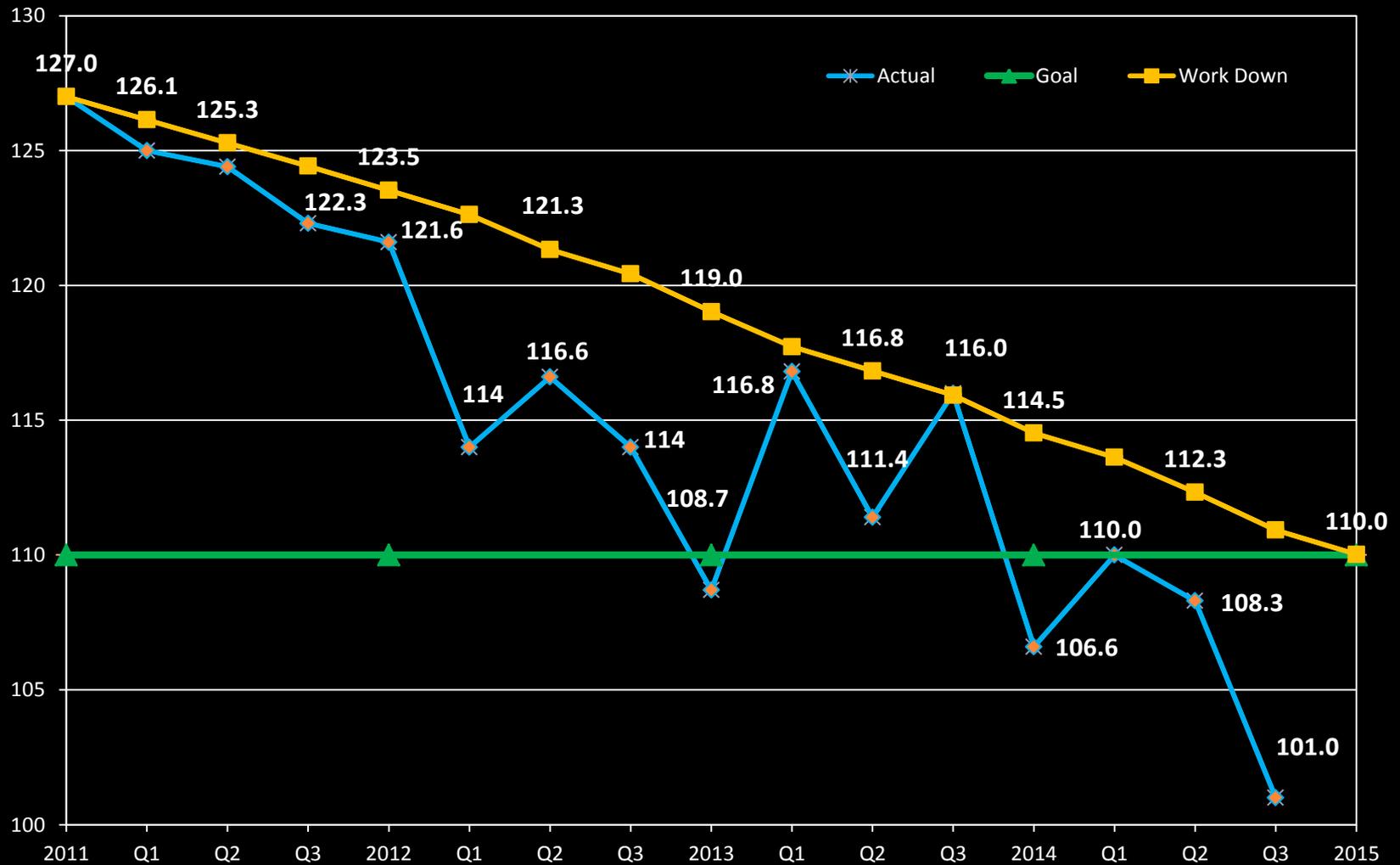


CRE Reduction

U.S. Collective Radiation Exposure (BWR)
Median Values – 3rd Quarter 2015

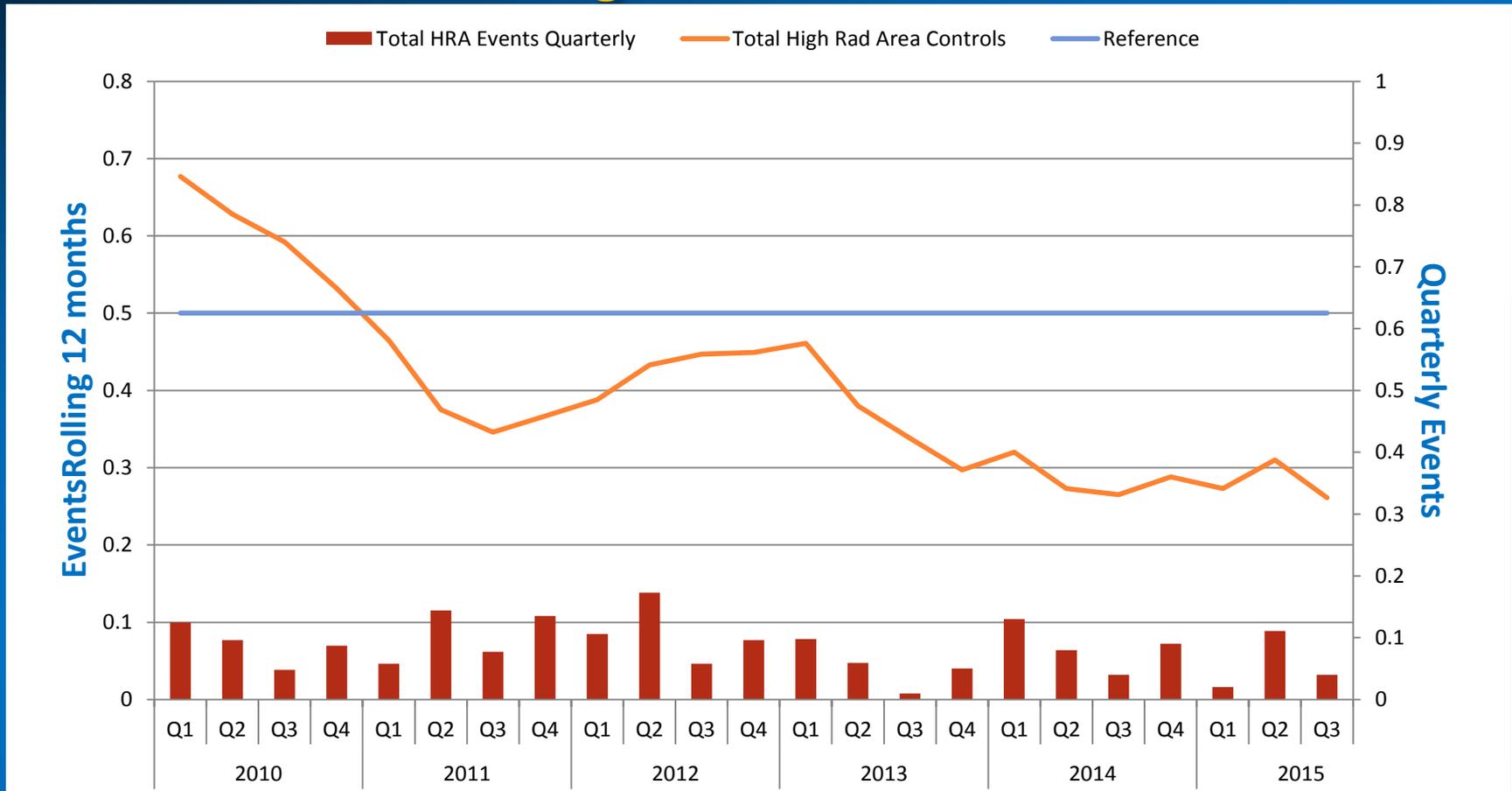


BWR Collective Radiation Exposure Median Person-Rem



Industry Performance and Trends (PIC Data)

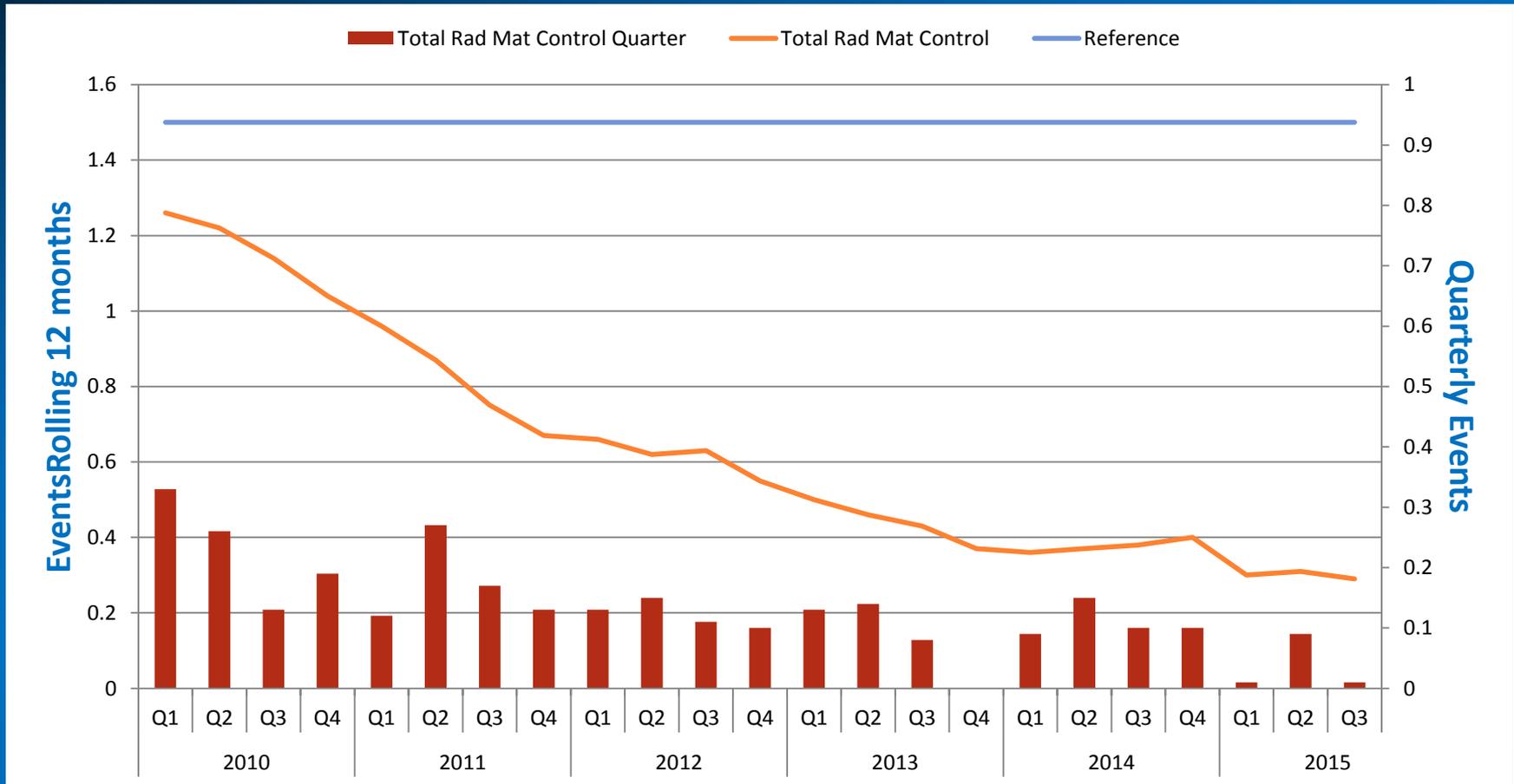
Total High Radiation Events



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Industry Performance and Trends (PIC Data)

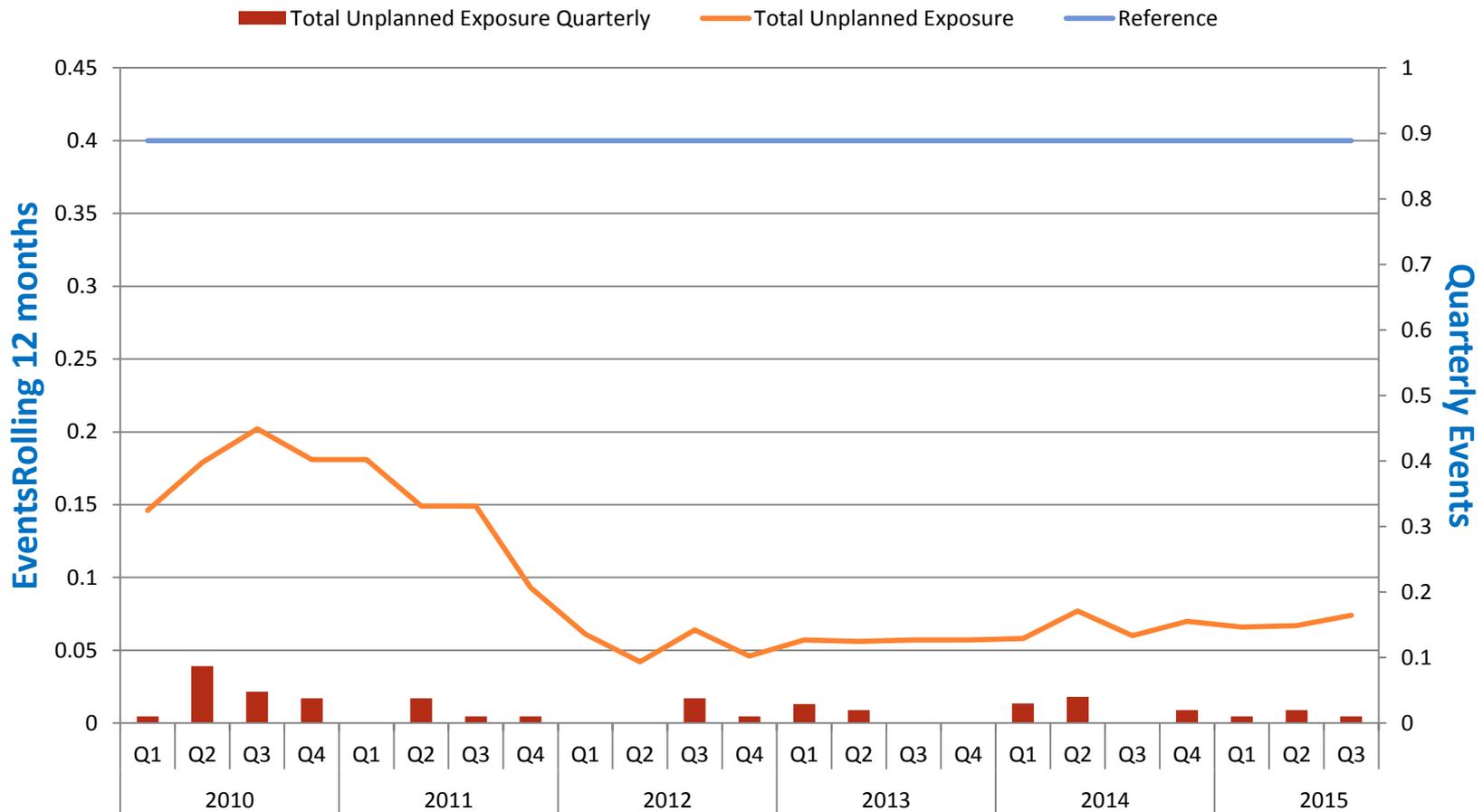
RAM Events



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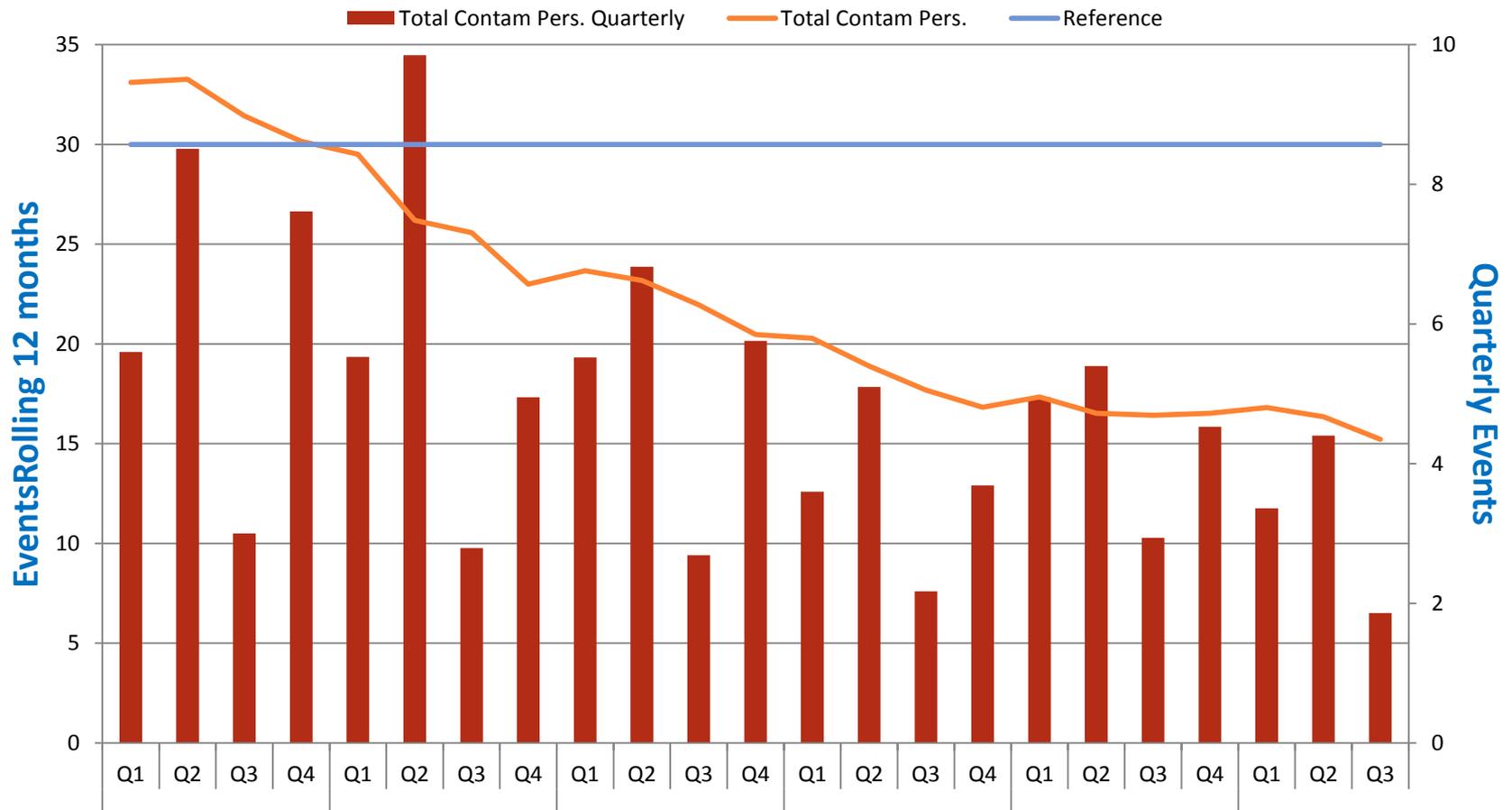
Industry Performance and Trends (PIC Data)

Unplanned Dose



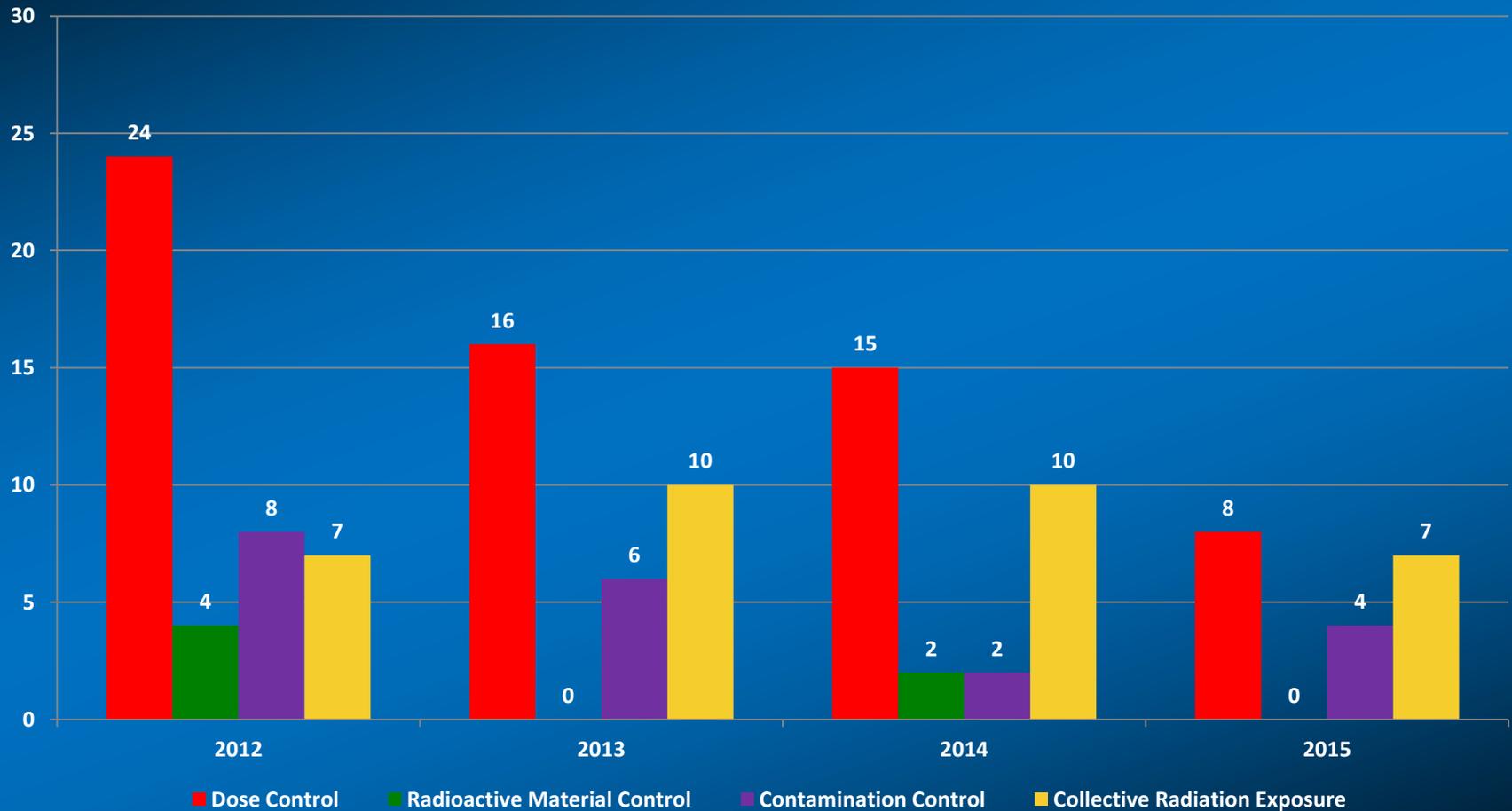
Industry Performance and Trends (PIC Data)

Personal Contamination Events



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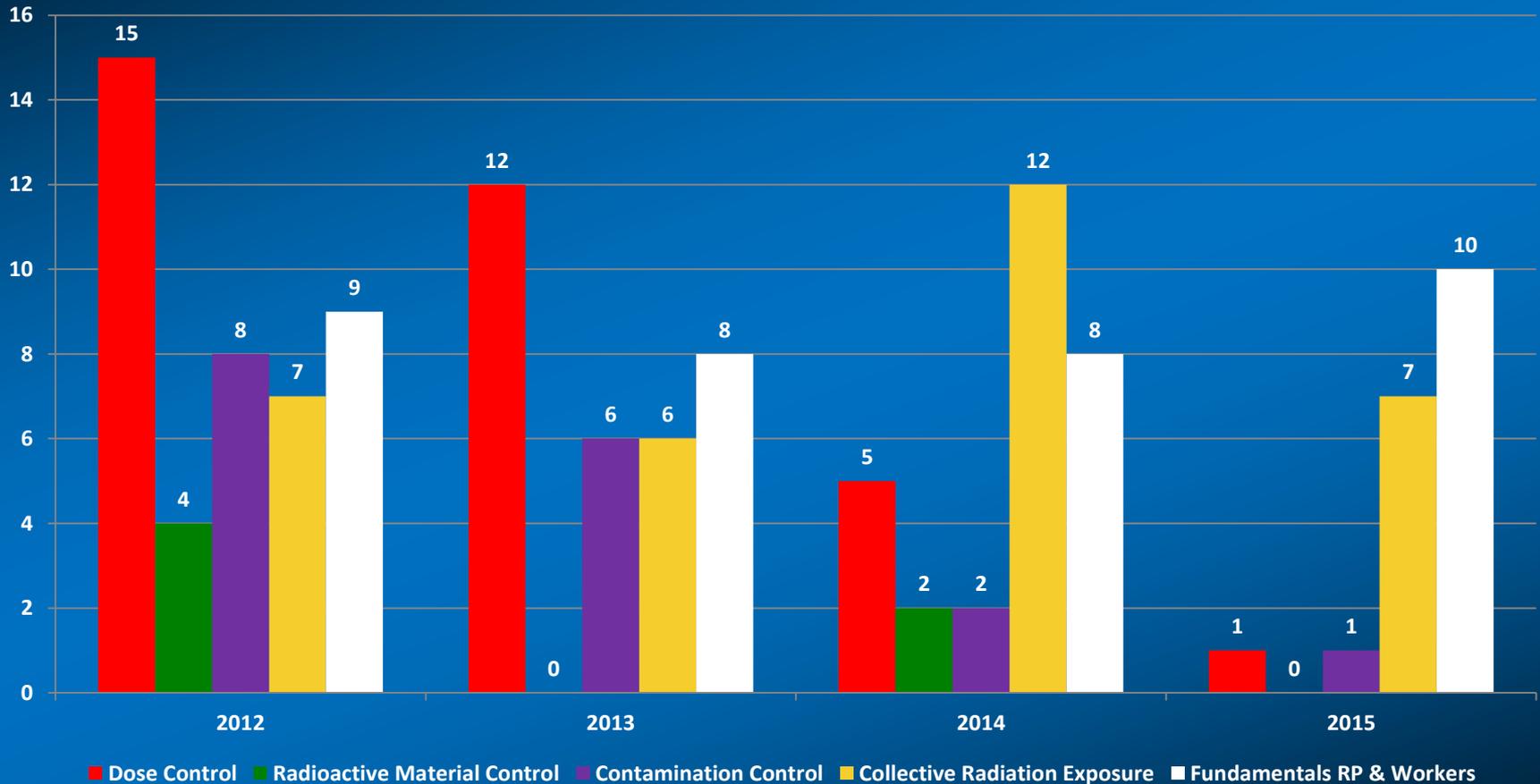
RP and RS AFIs Through 4th Qtr 2015



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RP and RS AFIs – New Slice

Through 4th Qtr 2015



2015 AFIs: Themes / Underlying Causes

Collective Radiation Exposure (RP.1 & RS.1)

- Station leaders have not established effective source term and dose reduction strategies
- Station leaders have not effectively reduced source term levels.
- Refueling outage activities were not planned and executed to optimize dose reduction.

Consequences:

- Large overruns in outage CRE; dose goals not met

Causes:

- Managers did not appropriately monitor or challenge to incorporate scope and details in work and ALARA plans.
- Managers do not understand the cause of rising high source term and don't advocate reduction strategies.
- Managers have not incorporated previously identified actions into plans.

2015 AFIs: Themes / Underlying Causes

Fundamentals (RP.1, RS.1, AND NP.1)

- Radiation protection technicians are not correctly performing some fundamental practices – contamination and dose control standards, monitoring free-release of material, performing pre-work surveys.
- Radiation workers are not following fundamentals such as contamination control practices and unauthorized entries into HRAs.

Consequences:

- Spread of contamination, high radiation areas events, increased potential for unplanned dose

Causes:

- RP Supervisors and leads do not correct deviations or rationalize deviations because of perceived low risk or low consequence
- Radiation workers deviate because of perceived low risk or low consequence.
- Contributing, supervisors, including radiation protection supervision, are not correcting or coaching to the standard.

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Revision: INPO 05-008, *Guidelines for Radiological Protection at Nuclear Power Stations*

Status

Issue First Quarter 2015

- Nuclear Promise Impact

Revision: INPO 05-008, *Guidelines for Radiological Protection at Nuclear Power Stations.*

Highlights of the revision include:

- **Reduced the recommended number of performance indicators**
- **Eliminated recommendation to manage worker dose to less than 2 rem/year and maintaining supplemental workers to less than 500 mrem/outage**
- **Describe a graded approach for long-term dose reduction plans**
- **Eliminate 25 percent ALARA plan reviews**

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Revision: INPO 05-008, *Guidelines for Radiological Protection at Nuclear Power Stations*

Highlights of the revision include:

- **Redefined guidance for establishing electronic dosimeter dose and dose rate setpoints**
- **Incorporated recommendations of IERs L2-11-41 and L2-11-1**
- **Updated use of EDEX for monitoring workers in non-uniform fields**
- **Clarified survey requirements for unconditional release of equipment and tools from the RCA**

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Revision: INPO 05-008, *Guidelines for Radiological Protection at Nuclear Power Stations*

Highlights of the revision include:

- Fixed instrument response checks - daily to weekly
- De-emphasis for level of response to Level 1 personal contamination events (PCEs)

Considering – from Nuclear Promise Project

- **Self-briefing workers**
- **Self-monitoring workers**

Industry 2020 Radiation Protection Indicator

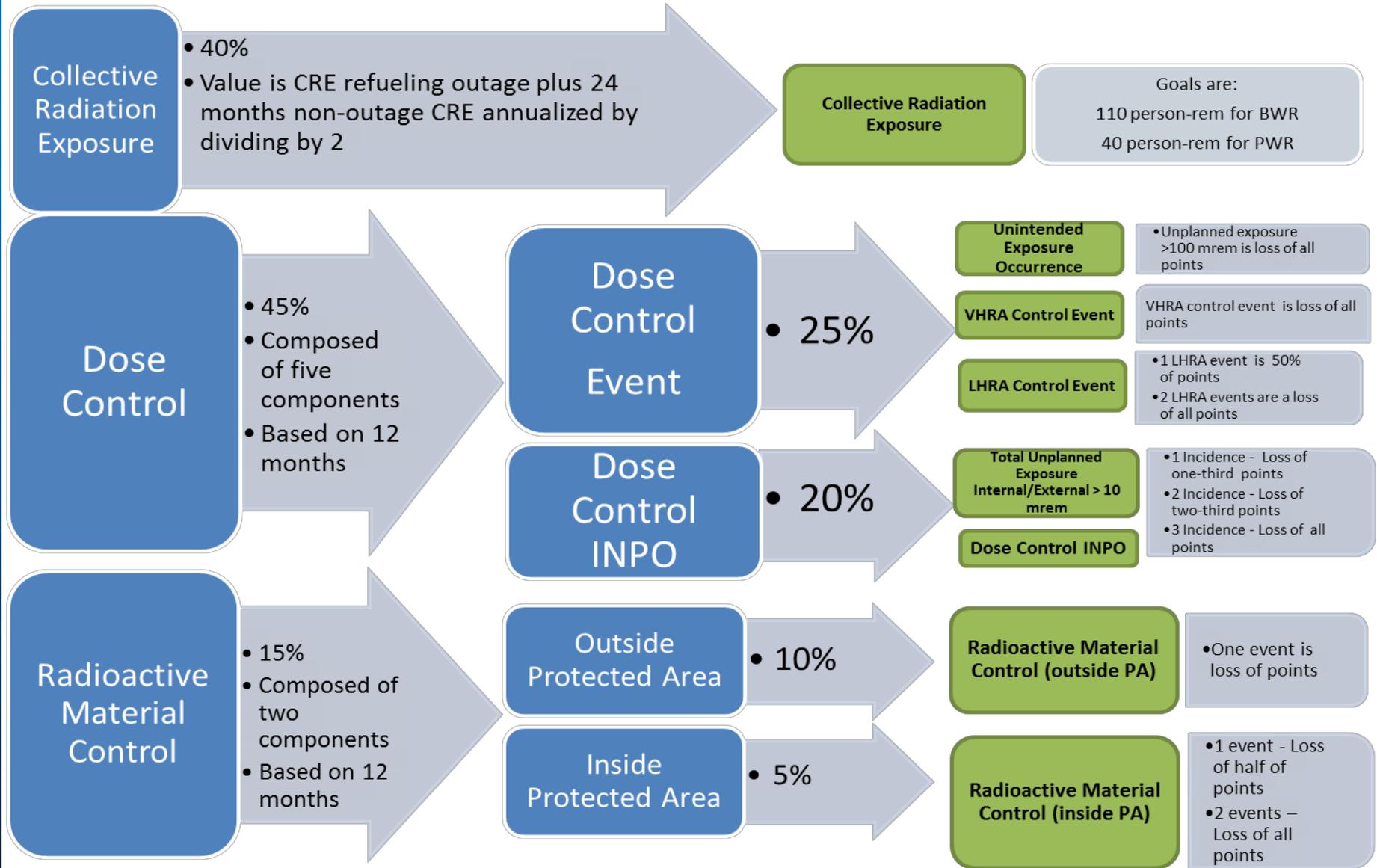
- Industry CNOs elected to maintain CRE as the **only** RP performance indicator to the INPO Index
- CRE will continue to comprise 10 points of the 100 point INPO Index
- PWRs and BWR CRE performance indicator will be determined using NEW calculation method:
 - Sum of CRE accrued during most recent refueling outage and CRE from most recent 24 months of non-refueling outage periods
 - Sum will be divided by 2 to approximate annualized values
- New method will ensure that dose from one (*and only one*) refuel outage is included in CRE indicator

Industry 2020 Radiation Protection Goal *Continued*

- Industry CNOs approved the 2020 CRE goals
 - No change for BWRs – 110 person-rem
 - PWR median goal 40 person-rem
 - New calculation method (24 months vs 18 months) results in lower CRE values for same performance
 - Scale of point loss is 120-40 person-rem
- 2020 Goals become effective 1/1/2016
- Proposed CRE / HRA / RAM indicator will be used for performance monitoring (Tier II)

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Illustration of Tier 2 Radiological Performance Indicator



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Questions & Comments