Palo Verde/NRC
Pre-submittal Meeting
Risk Informed Completion Times

February 18, 2015

Introductions

Bryan Thiele

Department Leader

Risk Informed Project Manager

Agenda

- Introduction ..... Bryan Thiele
- Palo Verde Overview ..... Thomas Romay
- License Amendment ..... Thomas Weber
- PRA Summary ..... Everett DePue
- Implementation Plan ..... Bryan Thiele
- Path Forward and Closing Comments ..... Bryan Thiele

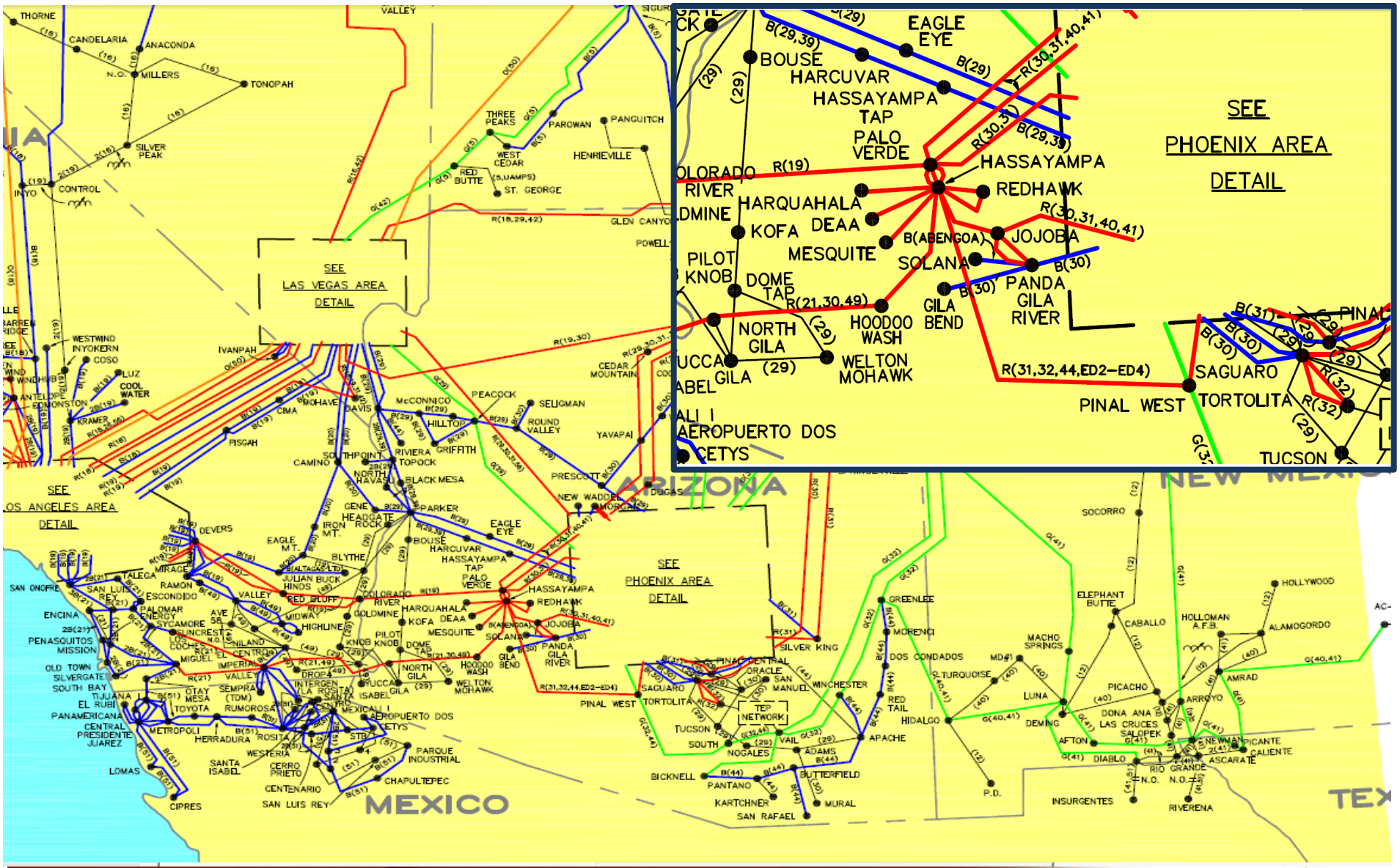
Desired Meeting Outcomes

- Summarize PVNGS design with focus on unique features
- Discuss license amendment content and variances from TSTF 505
- Provide overview of PRA models
- Discuss implementation plan
- Describe path forward

Palo Verde Design Overview

Tom Romay
Shift Manager
Senior Reactor Operator

Transmission Network



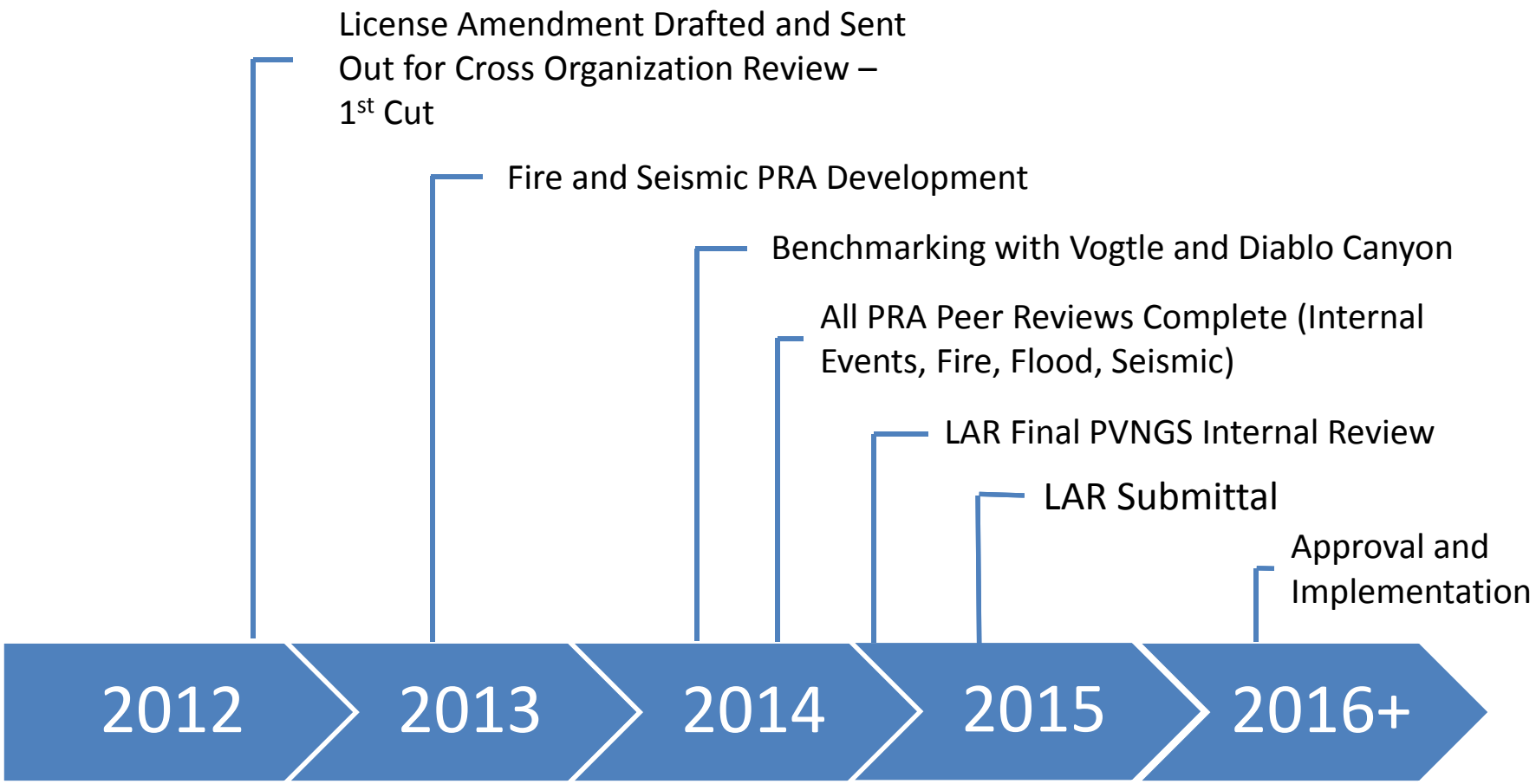
Palo Verde Design Features

- Three identical, separate Units, minimal shared SSCs
- No pressurizer PORVs
- Low leakage RCP seals following loss of seal cooling
- Four channels of class instrumentation (two trains w/2 channels each) with separate power
- Demonstrated capability to feed SG with no AC/DC power

License Amendment Request

Thomas Weber
Department Leader
Nuclear Regulatory Affairs

RICT Timeline



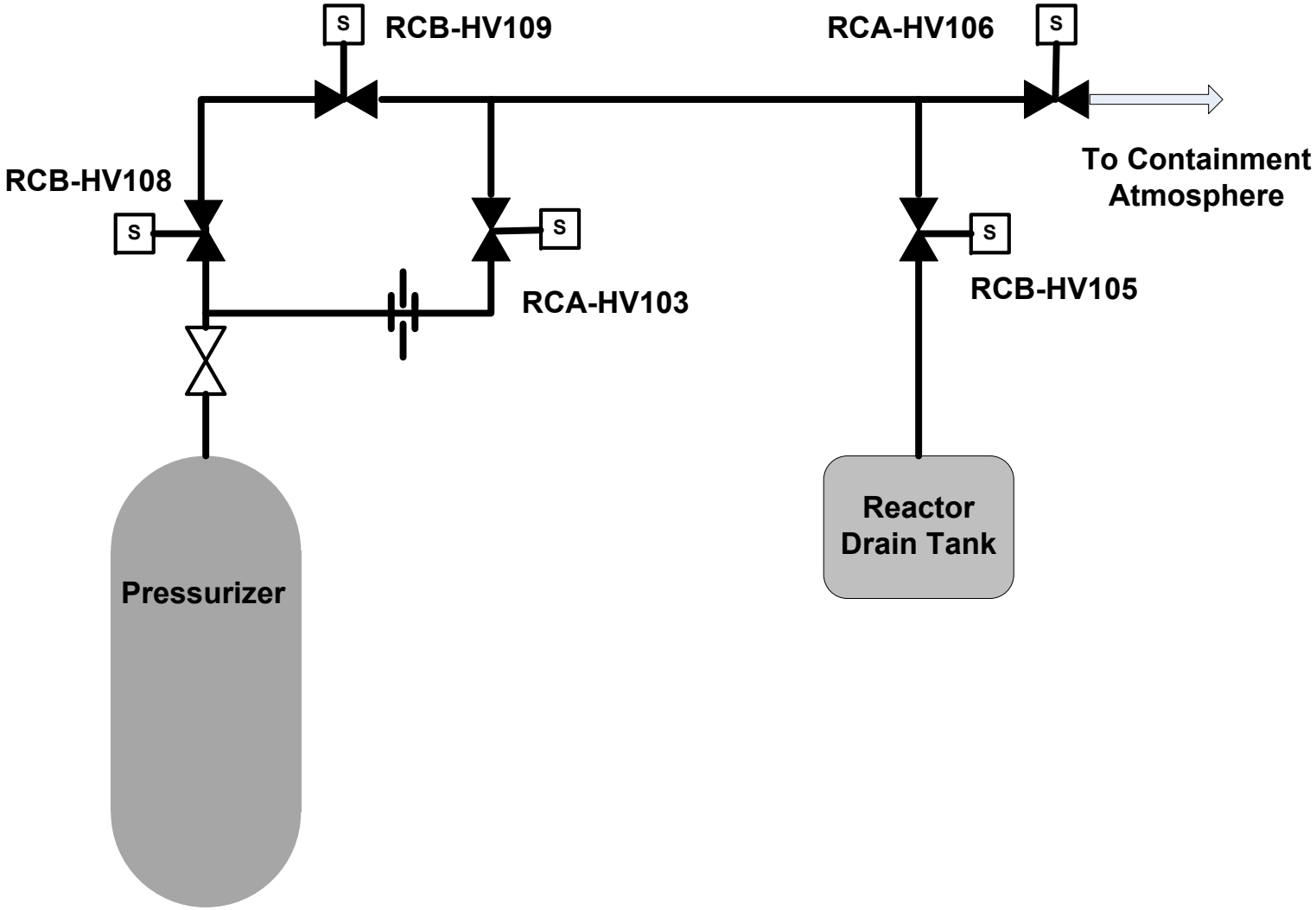
PVNGS LAR Content

- Based on TSTF 505-A & NEI 06-09-A
  - Scope includes components modeled in PRA
  - 25 LCOs
  - Mode 1 and 2 only
  - New TS Section 5.5 Program
  - Variances from TSTF 505 addressed in LAR and include:
    - RICT added to two LCOs not in TSTF 505
    - Miscellaneous variances described in LAR

TS 3.4.12, Pressurizer Vents

- Not in TSTF 505 or NUREG 1432
- In PV Safety Analysis
- Modeled in PRA
- RICT added to Two Required Actions
  - Note added to preclude use of RICT when all pressurizer vent paths are intentionally made inoperable

Pressurizer Vent Paths



TS 3.7.3, Main Feedwater Isolation Valves (MFIVs)

- Not in TSTF 505 but is in NUREG 1432
- LAR adds restoration action
- MFIVs modeled in PRA
- RICT added to Two Required Actions

Miscellaneous Variances

- TS 3.7.2, Main Steam Isolation Valves (MSIVs)
  - Did not add RICT for restoration conditions associated with MSIV actuator trains
- TS 3.7.4, Atmospheric Dump Valves (ADVs)
  - Note added to preclude use of RICT when all ADV lines are intentionally made inoperable
- TS 3.7.9, Ultimate Heat Sink (UHS)
  - Added new 1 hour restoration condition for UHS
  - Note added to preclude use of RICT when the UHS is intentionally made inoperable
- TS 3.8.7, Inverters
  - Revised note since PVNGS design has two inverters per train supporting 4 channels of vital instruments
  - Note precludes use of RICT for two or more inverters intentionally made inoperable resulting in a loss of safety function

Summary

- LAR to remove "Second Completion Time" (TSTF 439) in progress
- Minimizing LARs at PVNGS that have changes to TSTF 505 LCOs
- Monitoring TSTF 505 Operating Experience
- Participating in Industry Committees
- Monitoring TSTF 505 RAIs

PRA Models

Everett DePue
Senior Engineer
PRA Lead for TSTF-505

Summary of PRA Models

- PRA models developed and peer reviewed
  - Internal events
  - Internal flood
  - Internal fire
  - Seismic
- RG 1.200 Rev. 2 hazards screened and peer reviewed
- Total CDF/LERF meet RG 1.174 Rev. 2 limits
- Internal events and internal flood risk very low
- CDF/LERF dominated by internal fire and seismic hazards

Internal Events PRA

- Peer review by CEOG conducted in 1999
- Self-assessment performed against entire RA-Sa-2009 in 2015
- RA-Sa-2009 Supporting Requirements met to Capability Category II except:
  - Some sub-elements of SY-C1, SY-C2 System Notebook Documentation need completion
    - To be completed prior to RICT Program implementation

Internal Flood PRA

- Industry Peer Review conducted in 2010
- All ASME/ANS PRA requirements met to Capability Category II after peer review findings addressed

Internal Fire PRA

- PVNGS is not NFPA-805 plant,
  - Fire PRA complies with methods in NUREG/CR-6850
- Industry Peer Review conducted in 2012
- Follow-up Industry Peer Review conducted in 2014 - addressed 2012 findings
- All ASME/ANS requirements met to Capability Category II after peer review findings addressed

Seismic PRA

- Industry peer review conducted in 2013
- All ASME/ANS requirements met to Capability Category II after peer review findings addressed except
  - SPR B7 Complementary Success Logic
    - Meets Capability Category II for ASME/ANS RA-Sb-2013

Plant-Specific Modeling

- RICT CRMP model will be either:
  - Real time risk model as currently used for existing Technical Specification CRMP

    OR
  - Pre-solved solutions (STP approach)

- Common Cause treatment will be in accordance with NEI 06-09-A or Regulatory Guide 1.177 Rev. 1

Plant Modifications

- PRA models rely on installation of modifications or taking compensatory measures
- RICT Program will not be implemented until modifications complete or compensatory measures in place
- FLEX strategies not yet reflected in the PRA models – conservatism

Summary

- All hazards have been evaluated in accordance with RG 1.200 Rev. 2
- All PRA models peer reviewed
- Capability Category II met for all PRA models with three exceptions
- Total CDF/LERF meet RG 1.174 Rev. 2

Implementation Plan

Bryan Thiele
Department Leader
Risk Informed Project Manager

Implementation Plan

- Engineering coordinate RICT implementation
- Cross organization team supporting implementation
- RICT implemented in Modes 1 and 2 only
- CRMP tool PRA Models will include Internal Events, Internal Flooding, Fire, and Seismic
- Procedure changes, training, and qualifications will support RICT CRMP capability
  - Extensive use of industry participation & benchmarking to develop program, procedures, training

Procedures

- Revise 40DP-9RS01, Operations Department Online Nuclear Risk Management Mode 1 and 2, to include
  - RICT
  - Risk management action times
  - Risk management action determinations
  - PRA functionality
- New RICT Program Procedure

Training

- Licensed Operators
  - Hands-on training on RICT calculations
  - Classroom training to address how RICT impacts Station Operations
- Station Management
  - Affected managers trained on process, expectations, limitations
  - Multi-discipline management representatives attend annual MIT nuclear operational risk management (NORM) course
- Engineering
- Work Management

Communications

- Industry peers via TSTF-505 task force
- Site-wide communication
  - Newsletter
  - VP weekly video
  - While submittal under review
  - Once submittal is approved
- Leader Alignment Meetings
- Department All Hands Meetings

Modifications

- DC ammeter circuits
- Non-class 1E DC motor circuits
- Replace RCP control cables with fire rated cables
- Install new Steam Generator (SG) makeup pump that utilizes FLEX connections
- Breaker coordination on risk significant non-class 1E motor control centers/panels

Path Forward
and
Closing Comments

Bryan Thiele
Department Leader
Risk Informed Project Manager

Path Forward

- Resolve Fire PRA peer review findings and complete documentation
- Submit LAR in June
- Finalize scope and install modifications
- Develop procedures, software and training in parallel with NRC review
- Implement in late 2016

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