

## CCNPP3COLA NPEmails

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**From:** Arora, Surinder  
**Sent:** Tuesday, August 02, 2011 10:39 AM  
**To:** Carneal, Jason  
**Cc:** CCNPP3COL Resource; Colaccino, Joseph  
**Subject:** FW: ACRS dry run presentation slides - FSAR Chapter 15  
**Attachments:** ACRS Slide Pres Chapter 15 8\_02\_11 NRC Slide Exchange Calvert Cliffs 3.pptx

Jason,

Attached are UniStar's ACRS Presentation Slides for Chapter 15. Please review them and share with the appropriate staff reviewers. Please let me know:

1. When can we get them our slides?
2. Based on the review of their slides, do we need to have a meeting or phone call to discuss them?
3. If no meeting is required, are there any comments?

Thanks.

**SURINDER ARORA, PE**  
**PROJECT MANAGER,**  
**Office of New Reactors**  
**US Nuclear Regulatory Commission**

Phone: 301 415-1421  
FAX: 301 415-6406  
Email: [Surinder.Arora@nrc.gov](mailto:Surinder.Arora@nrc.gov)

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**From:** Poche, Robert [<mailto:robert.poche@unistarnuclear.com>]  
**Sent:** Tuesday, August 02, 2011 10:29 AM  
**To:** Arora, Surinder  
**Subject:** ACRS dry run presentation slides - FSAR Chapter 15

Surinder,

Our ACRS presentation slides for the FSAR Chapter 15 dry run are attached.

Robert Poche  
Regulatory Affairs Project Manager  
Calvert Cliffs Nuclear Power Plant Unit 3  
(410) 470-5530 Office  
(509) 528-5513 Cell  
[robert.poche@unistarnuclear.com](mailto:robert.poche@unistarnuclear.com)  
[rpoche1@aol.com](mailto:rpoche1@aol.com)

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**Hearing Identifier:** CalvertCliffs\_Unit3Cola\_NonPublic\_EX  
**Email Number:** 6421

**Mail Envelope Properties** (B46615B367D1144982B324704E3BCEED7E46365190)

**Subject:** FW: ACRS dry run presentation slides - FSAR Chapter 15  
**Sent Date:** 8/2/2011 10:38:31 AM  
**Received Date:** 8/2/2011 10:38:34 AM  
**From:** Arora, Surinder

**Created By:** Surinder.Arora@nrc.gov

**Recipients:**  
"CCNPP3COL Resource" <CCNPP3COL.Resource@nrc.gov>  
Tracking Status: None  
"Colaccino, Joseph" <Joseph.Colaccino@nrc.gov>  
Tracking Status: None  
"Carneal, Jason" <Jason.Carneal@nrc.gov>  
Tracking Status: None

**Post Office:** HQCLSTR01.nrc.gov

Files	Size	Date & Time
MESSAGE	1514	8/2/2011 10:38:34 AM
ACRS Slide Pres Chapter 15 8_02_11 NRC Slide Exchange Calvert Cliffs 3.pptx		
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**Options**  
**Priority:** Standard  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**  
**Recipients Received:**



## UNISTAR NUCLEAR ENERGY

**Presentation to ACRS  
U.S. EPR™ Subcommittee  
Calvert Cliffs Nuclear Power Plant Unit 3  
FSAR Chapter 15, Transient and Accident Analysis  
August 18, 2011**



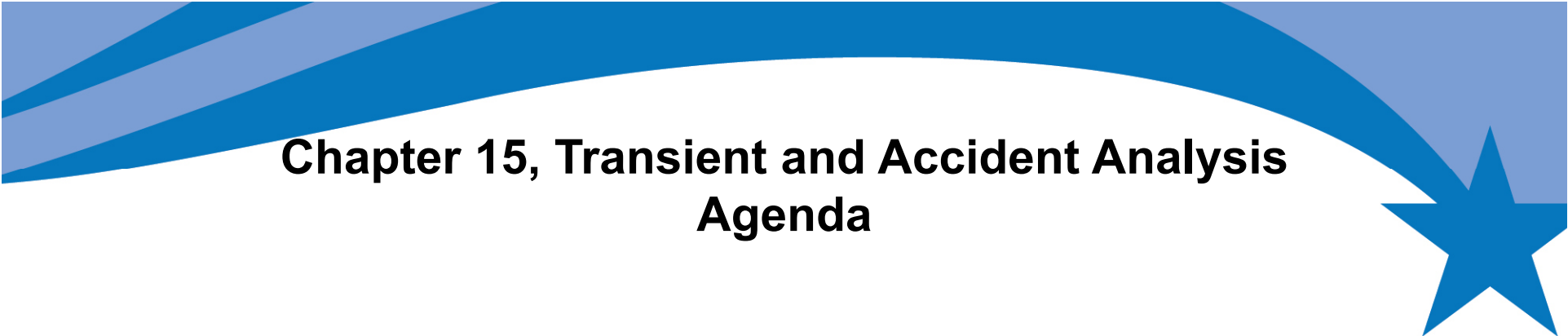
# Introduction

- RCOLA authored using 'Incorporate by Reference' (IBR) methodology
- To simplify document presentation and review, only supplemental information, or site-specific information, or departures/exemptions from the U.S. EPR FSAR are contained in the Calvert Cliffs Unit 3 COLA
- AREVA U.S. EPR FSAR ACRS Meeting for Chapter 15, Part 1 – Transient and Accident Analysis occurred on February 7, 2011. The AREVA U.S. EPR FSAR ACRS Meeting for Chapter 15, Part 2 – Transient and Accident Analysis occurred on August 18, 2011.



# Introduction

- Today's Presentation was prepared by UniStar and is supported by AREVA (U.S. EPR Supplier).
  - Tim Kirkham (UniStar - Senior Health Physicist)
  - John N. Hamawi, Ph. D. (AREVA –Advisory Engineer)
  - Jerald Holm (AREVA –Licensing Engineer)
- Today Greg Gibson, UniStar Senior Vice President – Regulatory Affairs, will present the Calvert Cliffs Unit 3 FSAR Chapter 15.
- The focus of today's presentation will be on site-specific information that supplements the U.S. EPR FSAR.



## Chapter 15, Transient and Accident Analysis Agenda

- Chapter 15, Transient and Accident Analysis
  - COL Information/Interface Items
  - Departures/Exemptions
- Conclusions



## Chapter 15, Transient and Accident Analysis COL Information Items

### ➤ Transient Analysis with Incore Trips

- UNE will provide for NRC review, prior to the first cycle of operation, a report that demonstrates compliance with the following items:
  - Examine fuel assembly characteristics to verify that they are hydraulically compatible based on the criterion that a single package of assembly specific critical heat flux (CHF) correlations can be used to evaluate the assembly performance.
  - Verify that uncertainties used in the setpoint analyses are appropriate for the plant and cycle being analyzed.
  - Verify that the departure from nucleate boiling ratio (DNBR) and linear power density (LPD) satisfy specified acceptable fuel design limit (SAFDL) with a 95/95 assurance.



## Chapter 15, Transient and Accident Analysis COL Information Items

- Transient Analysis with Incore Trips (continued)
  - Review the U.S. EPR FSAR Tier 2 analysis results for the first cycle to confirm that the static setpoint value provides adequate protection for at least three limiting anticipated operational occurrences (AOO).





## Chapter 15, Transient and Accident Analysis Departures/Exemptions

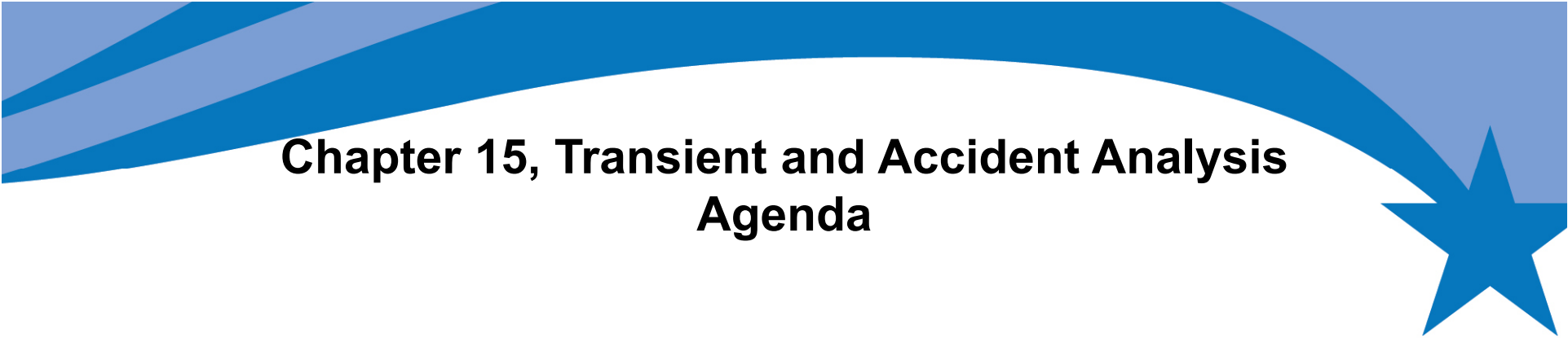
### ➤ Site Specific $\chi/Q$ Values

- Conservative estimates of atmospheric Accident values for the Exclusion Area Boundary (EAB), Low Population Zone (LPZ) and Main Control Room are presented in the U.S. EPR FSAR and bound the Calvert Cliffs Unit 3 values except the 0-2 hour value for the LPZ.
- The U.S.EPR FSAR provides the Accident  $\chi/Q$  of  $1.75\text{E-}04 \text{ sec/m}^3$  at the LPZ - 1.5 miles during the 0-2 hr period. The corresponding calculated site-specific short-term atmospheric dispersion factor for Calvert Cliffs Unit 3 is  $2.151\text{E-}04 \text{ sec/m}^3$  which exceeds/departs from the U.S. EPR value.
- The site-specific Accident Dispersion factors were used in calculating doses from accident scenarios specified in the U.S. EPR FSAR Chapter 15. Calvert Cliffs Unit 3 doses are conservatively within the limitations of 10 CFR 50.34 and GDC 19.

# Chapter 15, Transient and Accident Analysis Departures/Exemptions

**Table 15.0-2— {CCNPP Unit 3 LPZ Radiological Consequences of U.S. EPR Design Basis Accidents}**

Design Basis Accident		Offsite Dose CCNPP Unit 3 LPZ rem (TEDE)	Acceptance Criterion rem (TEDE)
LOCA		9.1	25
Small line break outside of Reactor Building		0.4	2.5
SGTR	Pre-incident spike	0.3	25
	Coincident spike	0.3	2.5
MSLB	Pre-incident spike	0.1	25
	Coincident spike	0.2	2.5
	Fuel rod clad failure	2.6	25
	Fuel overhear	2.8	25
RCP locked rotor/broken shaft		0.9	2.5
Rod ejection		3.4	6.3
Fuel handling accident		1.2	6.3



## Chapter 15, Transient and Accident Analysis Agenda

- Chapter 15, Transient and Accident Analysis
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- **Conclusions**



## Conclusions

- One COL Information Item, as specified by U. S. EPR FSAR, is addressed in Calvert Cliffs Unit 3 FSAR Chapter 15, Transient and Accident Analysis.
- One Departure/ One Exemption in Chapter 15 from the U.S. EPR FSAR for Chapter 15 of the Calvert Cliffs Unit 3 FSAR.
- There are no NRC SER Open Items or Confirmatory Items
- No ASLB Contentions
- Responses to all RAIs have been submitted.



## Acronyms

- ACRS – Advisory Committee on Reactor Safeguards
- AOO – Anticipated Operational Occurrences
- ASLB – Atomic Safety & Licensing Board
- CHF – Critical Heat Flux
- COL – Combined License
- COLA – Combined License Application
- DNBR – Departure from Nucleate Boiling Ratio
- EAB – Exclusion Area Boundary
- FSAR – Final Safety Analysis Report
- IBR – Incorporate by Reference
- LOCA – Loss of Coolant Accident
- LPD – Linear Power Density
- LPZ – Low Population Zone
- NRC – Nuclear Regulatory Commission
- MSLB – Main Steam Line break
- RCOLA – Reference COL Application
- RCP – Reactor Coolant Pump
- SAFDL – Specified Acceptable Fuel Design Limit
- SER – Safety Evaluation Report
- SG – Safety Guide
- SGTR – Steam Generator Tube Rupture
- TEDE – Total Effective Dose Equivalent