



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

January 14, 2013

NOTE TO: FILE

FROM: Sherry Meador, Technical Secretary */RA/*  
Advisory Committee on Reactor Safeguards

The minutes of the subject meeting were certified on July 26, 2013 as the official record of the proceedings of that meeting.



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

July 29, 2013

MEMORANDUM TO:           ACRS Members

FROM:                    Sherry Meador                    /RA/  
                              Technical Secretary, ACRS

SUBJECT:                 CERTIFICATION OF THE MEETING MINUTES FROM  
                              THE ADVISORY COMMITTEE ON REACTOR  
                              SAFEGUARDS 606<sup>th</sup> FULL COMMITTEE MEETING  
                              HELD ON JULY 9-11, 2013, IN ROCKVILLE, MARYLAND

The minutes of the subject meeting were certified on July 26, 2013 as the official record of the proceedings of that meeting. A copy of the certified minutes is attached.

Attachment:  
As stated



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

July 26, 2013

MEMORANDUM TO: Sherry Meador, Technical Secretary  
Advisory Committee on Reactor Safeguards

FROM: J. Sam Armijo */RA/*  
ACRS Chairman

SUBJECT: MINUTES OF THE 606<sup>th</sup> MEETING OF THE ADVISORY  
COMMITTEE ON REACTOR SAFEGUARDS (ACRS),  
JULY 9-11, 2013

I hereby certify, to the best of my knowledge and belief, that the minutes of the subject meeting are an accurate record of the proceedings for that meeting.

<b>OFFICE</b>	ACRS	ACRS:RSB/Sunsi
<b>NAME</b>	SMeador	CSantos/sam
<b>DATE</b>	07/26/13	07/26/13

**OFFICIAL RECORD COPY**

MINUTES OF THE 606<sup>th</sup> MEETING OF THE  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

ROCKVILLE, MARYLAND

The 606<sup>th</sup> meeting of the Advisory Committee on Reactor Safeguards (ACRS) was held in Conference Room T2B1, Two White Flint North Building, 11545 Rockville Pike, Rockville, Maryland, on July 9-12, 2013. A copy of the meeting agenda is attached.

The summary report ML13224A060 from the ACRS Chairman to the NRC Chairman contains the following information for this meeting: (1) an accurate description of each matter discussed and (2) a list of all the documents issued or approved by the Committee. A copy of the summary report is attached. The documents received by the Committee are listed in the references of each committee letter associated with this meeting.

A transcript of selected portions of the meeting is available in the NRC's public document room ([pdr.resource@nrc.gov](mailto:pdr.resource@nrc.gov) or 1-800-397-4209), or from the Publicly Available Records System (PARS) component of NRC's document system (ADAMS), or at <http://www.nrc.gov/reading-rm/doc-collections/acrs/agenda/>. The presentation slides and handouts used during the meeting are attached to these transcripts.

ATTENDEES

ACRS Members

Dr. J. Sam Armijo (Chairman), Mr. John Stetkar (Vice-Chairman), Mr. Harold Ray (Member-at-Large), Dr. Sanjoy Banerjee, Dr. Dennis Bley, Mr. Charles Brown, Dr. Michael Corradini, Dr. Dana A. Powers, Dr. Joy Rempe, Dr. Michael Ryan, Dr. Stephen Schultz, Mr. Gordon Skillman, and Dr. William Shack.

ACRS Staff

E. Hackett  
C. Santos  
C. Brown  
H. Nourbakhsh

A list of other attendees is attached.



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 – 0001**

June 13, 2013

**AGENDA  
606<sup>th</sup> ACRS MEETING  
July 9-12, 2013**

**TUESDAY, JULY 9, 2013, CONFERENCE ROOM T-2B1, 11545 ROCKVILLE PIKE,  
ROCKVILLE, MD**

- 1) 1:00 PM - 1:05 PM      Opening Remarks by the ACRS Chairman (Open) (JSA/EMH)  
    1.1)    Opening Statement  
    1.2)    Items of Current Interest
- 2) 1:05 PM - 4:00 PM      Spent Fuel Pool Study (SFPS) (Open) (JSA/CLB)  
    2.1)    Remarks by the Subcommittee Chairman  
    2.2)    Briefing by and discussions with representatives of the  
            NRC staff regarding the conclusion of the study to examine  
            consequences of a beyond-design-basis earthquake  
            affecting the spent fuel pool for a US Mark I boiling water  
            reactor.
- 4:00 PM - 4:15 PM      \*\*\* BREAK \*\*\***
- 3) 4:15 PM - 7:00 PM      Preparation of ACRS Reports (Open)  
    3.1)    Spent Fuel Pool Study (JSA/CLB)

**WEDNESDAY, JULY 10, 2013, CONFERENCE ROOM T-2B1, 11545 ROCKVILLE PIKE,  
ROCKVILLE, MD**

- 4) 8:30 AM - 8:35 AM      Opening Remarks by the ACRS Chairman (Open) (JSA/EMH)  
    4.1)    Opening Statement  
    4.2)    Items of Current Interest

- 5) 8:35 AM – 10:30 AM      State of the Art Reactor Consequence Analyses (SOARCA) Uncertainty Analyses (Open) (WJS/HPN)
- 5.1)    Remarks by the Subcommittee Chairman
  - 5.2)    Briefing by and discussions with representatives of the NRC staff regarding the draft NUREG/CR-7155 Report, “State-of-the-Art Reactor Consequence Analyses Project, Uncertainty Analysis of the Unmitigated Long-Term Station Blackout of the Peach Bottom Atomic Power Station.”

**10:30 AM - 10:45 PM      \*\*\* BREAK \*\*\***

- 6) 10:45 AM – 12:45 PM      Proposed Revision to 10 CFR Part 61 (Open) (MTR/DAW)
- 6.1)    Remarks by the Subcommittee Chairman
  - 6.2)    Briefing by and discussions with representatives of the NRC staff regarding a proposed rulemaking to modify portions of 10 CFR Part 61, “Licensing Requirements for Land Disposal of Radioactive Waste.”

**12:45 PM - 1:45 PM      \*\*\* LUNCH \*\*\***

- 7) 1:45 PM - 7:00 PM      Preparation of ACRS Reports (Open)
- 7.1)    Spent Fuel Pool Study (JSA/CLB)
  - 7.2)    SOARCA Uncertainty Analyses (WJS/HPN)
  - 7.3)    Proposed Revision to 10 CFR Part 61 (MTR/DAW)

There may be 15-minute breaks at some points during this activity.

**THURSDAY, JULY 11, 2013, CONFERENCE ROOM T-2B1, 11545 ROCKVILLE PIKE, ROCKVILLE, MD**

- 8) 8:30 AM - 9:15 AM      Discussion of Topics for Meeting with the Commission (Open) (JSA, et al. /EMH, et al.)
- Discussion of the following topics for meeting with the Commission:

- 8.1) Overview
- 8.2) Draft Design Specific Review Standard for mPower iPWR Chapter 7, "Instrumentation and Control Systems"
- 8.3) Station Blackout Rulemaking
- 8.4) Next Generation Nuclear Plant (NGNP) Licensing Issues
- 8.5) Draft NUREG-2125, "Spent Fuel Transportation Risk Assessment"
- 8.6) Draft NUREG-1855, "Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decisionmaking"

**9:15 AM - 9:30 AM**

**\*\*\* BREAK \*\*\***

9) 9:30 AM - 11:30 AM

Meeting with the Commission (Open) (JSA, et al. /EMH, et al.)  
Meeting with the Commission, Commissioners' Conference Room, One White Flint North, to discuss topics listed under Item 8.

**11:30 AM - 1:00 PM**

**\*\*\* LUNCH \*\*\***

10) 1:00 PM - 7:00 PM

Preparation of ACRS Reports (Open)  
Continue discussion of the proposed ACRS reports listed under Item 7. There may be 15-minute breaks at some points during this activity.

**FRIDAY, JULY 12, 2013, CONFERENCE ROOM T-2B1, 11545 ROCKVILLE PIKE, ROCKVILLE, MD**

11) 8:30 AM - 8:35 AM

Opening Remarks by the ACRS Chairman (Open) (JSA/EMH)  
11.1) Opening Statement  
11.2) Items of Current Interest

12) 8:35 AM - 10:00 AM

Future ACRS Activities/Report of the Planning and Procedures Subcommittee (Open/Closed) (JSA/EMH)  
12.1) Discussion of the recommendations of the Planning and Procedures Subcommittee regarding items proposed for consideration by the Full Committee during future ACRS meetings.

- 12.2) Report of the Planning and Procedures Subcommittee on matters related to the conduct of ACRS business, including anticipated workload and member assignments.

**[NOTE: A portion of this meeting may be closed pursuant to 5 U.S.C. 552b (c) (2) and (6) to discuss organizational and personnel matters that relate solely to internal personnel rules and practices of the ACRS, and information the release of which would constitute a clearly unwarranted invasion of personal privacy.]**

- 13) 10:00 AM - 10:15 AM      Reconciliation of ACRS Comments and Recommendations  
(Open) (JSA/EMH/CS)  
Discussion of the responses from the NRC Executive Director for Operations to comments and recommendations included in recent ACRS reports and letters.
- 14) 10:15 AM - 11:00 AM      Miscellaneous (Open) (JSA/EMH)  
Discussion of matters related to the conduct of Committee activities and specific issues that were not completed during previous meetings, as time and availability of information permit.

**NOTES:**

- When appropriate, members of the public and representatives of the nuclear industry may provide their views during the briefings.
- During the meeting, phone number 301-415-7360 should be used in order to contact anyone in the ACRS Office.
- Presentation time should not exceed 50 percent of the total time allocated for a given item. The remaining 50 percent of the time is reserved for discussion.
- Thirty five (35) hard copies and one (1) electronic copy of the presentation materials should be provided to the ACRS in advance of the briefing.
- One (1) electronic copy of each presentation should be emailed to the Designated Federal Official 1 day before the meeting. If an electronic copy cannot be provided within this timeframe, presenters should provide the Designated Federal Official with a CD containing each presentation at least 30 minutes before the meeting.





**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

August 13, 2013

The Honorable Allison M. Macfarlane  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

**SUBJECT: SUMMARY REPORT – 606<sup>th</sup> MEETING OF THE ADVISORY COMMITTEE ON  
REACTOR SAFEGUARDS, JULY 9-12, 2013**

Dear Chairman Macfarlane:

During its 606<sup>th</sup> meeting, July 9-12, 2013, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports and memoranda:

**REPORTS**

Reports to Allison M. Macfarlane, Chairman, NRC, from J. Sam Armijo, Chairman, ACRS:

- Revisions to Low-Level Radioactive Waste Disposal Requirements (10 CFR Part 61), dated July 22, 2013
- Spent Fuel Pool Study, dated July 18, 2013

**MEMORANDA**

Memoranda to R. W. Borchardt, Executive Director for Operations, NRC, from Edwin M. Hackett, Executive Director, ACRS:

- Proposed Draft Guide (DG-8031), dated July 17, 2013
- Draft Revisions to Standard Review Plan Sections, dated July 17, 2013

## HIGHLIGHTS OF KEY ISSUES

### 1. Spent Fuel Pool Study

The Committee met with representatives of the NRC staff regarding the Spent Fuel Pool Study (SFPS). The primary objective of the SFPS was to determine the safety benefit of expedited transfer of spent fuel from the pool of a reference boiling water reactor (BWR) to a dry cask storage system. The study analyzed the potential radiological consequences of a postulated beyond-design-basis earthquake affecting the spent fuel pool under both high-density and low-density fuel loading conditions. The structural analysis showed that the spent fuel pool in this study had a 90% probability of surviving the postulated earthquake with no leak, a 5% probability of a small leak, and a 5% probability of a moderate leak. Further analyses showed that the likelihood of radioactive material release from the spent fuel caused by the postulated event was about 1 in 10 million years or lower, and that the health effects would be small for both low density and high density pool loadings. The insights from this study will inform the staff's broader regulatory analysis of the spent fuel pools at all U.S. operating nuclear reactors as part of the NRC's Japan Lessons learned Tier 3 activities.

### Committee Action

The Committee issued a letter to the NRC Chairman on this matter, dated July 18, 2013, concluding that the SFPS

- has been performed in a thorough and systematic manner,
- provides a state-of-the-practice assessment of the consequences of a beyond-design-basis seismic event on the spent fuel pool in a reference boiling water reactor containing either high or low-density fuel loading,
- has demonstrated that health effects from seismically initiated scenarios are very low for both high and low-density pool loadings,
- provides sound approaches, tools, and insights for a broader evaluation of the consequences of severe seismic events on spent fuel pools of different design, and
- will be valuable in determining whether expedited transfers to dry cask storage systems produce substantial safety benefit for the U.S. BWR and PWR fleet.

The Committee agreed with the staff's conclusion that the expedited transfer of spent fuel from the pool to dry cask storage does not provide a substantial safety enhancement for the reference plant and recommended that the SFPS be issued. The Committee also noted that an important insight from the SFPS is that the less conventional (1x8) high-density fuel loading configuration used in the reference plant can significantly reduce the consequences of seismically induced damage and recommended that this approach be further explored as a measure to provide additional defense in depth against spent fuel pool accidents.

2. State-of-the-Art Reactor Consequence Analyses (SOARCA) Uncertainty Analyses

The Committee met with representatives of the NRC staff regarding the draft NUREG/CR-7155, "State-of-the-Art Reactor Consequence Analyses Project, Uncertainty Analysis of the Unmitigated Long-Term Station Blackout of the Peach Bottom Atomic Power Station." The primary objectives of this uncertainty analysis are to evaluate the robustness of the SOARCA project's deterministic results and conclusions and to develop insight into the overall sensitivity of the SOARCA results to uncertainty in key modeling inputs. As this is a first-of-a-kind analysis in its integrated look at uncertainties in MELCOR accident progression and MACCS2 offsite consequence analyses, an additional objective is to demonstrate an uncertainty analysis methodology that could be used in future combined Level 2/3 probabilistic risk assessment studies. The members had a range of questions on the report covering both the analysis methods and the justification for some of the parameter uncertainties used in the models and the development of the 'upper level surrogate' parameters.

Committee Action

This was an information briefing. The Committee plans to have an additional subcommittee meeting in the early fall to further discuss the SOARCA uncertainty analysis.

3. Revisions to Low-Level Radioactive Waste Disposal Requirements (10 CFR Part 61)

The Committee met with representatives of the NRC staff to discuss the draft rulemaking language to include site-specific analyses into revisions to 10 CFR Part 61, "Low-Level Radioactive Waste Disposal Requirements." The staff presented draft rule language changes based on the public comments received on the proposed rule language published in the Federal Register in December 2012. This was the third time the Committee discussed these rulemaking changes with the staff. The Committee issued letters to the Commission dated March 18, 2010, and September 22, 2011.

Committee Action

The Committee issued a letter to the NRC Chairman on this matter, dated July 22, 2013, concluding that the draft rulemaking language significantly expands the regulatory requirements for the licensing of low level waste facilities and increases regulatory burden without sufficient justification. The Committee identified its major concerns with the draft rule language and plans to hold additional meetings with the staff and others to better understand the technical justification for the elements of concern. The letter also contained additional comments from an ACRS member.

4. Meeting with the Commission

On July 11, 2013, the Committee met with the Commission to discuss the following topics of mutual interest:

- Draft Design Specific Review Standard for mPower iPWR Chapter 7, “Instrumentation and Control Systems”
- Station Blackout Rulemaking
- Next Generation Nuclear Plant Licensing Issues
- Draft NUREG-2125, “Spent Fuel Transportation Risk Assessment”
- Draft NUREG-1855, “Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decisionmaking”

5. Proposed Draft Guide DG-8031

The Committee considered Proposed Revision 1 to Regulatory Guide 8.34, (DG-8031), “Monitoring Criteria and Methods to Calculate Occupational Radiation Doses,” and decided not to review it. The Committee has no objection to the staff’s proposal to issue the Guide for public comment but would like an opportunity to review the draft final version of this Guide following the public comment period.

6. Draft Revisions to Standard Review Plan Sections

The Committee considered the draft revisions to the following Standard Review Plan (SRP) Sections and decided not to review them.

- Section 3.7.1 – Seismic Design Parameters
- Section 3.7.2 – Seismic System Analysis
- Section 3.7.3 – Seismic Subsystems Analysis

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS

- The Committee considered the EDO’s response of June 20, 2013, to comments and recommendations included in the May 15, 2013 ACRS letter on the Next Generation Nuclear Plant key licensing issues. The Committee was satisfied with the EDO’s response.
- The Committee considered the EDO’s response of May 31, 2013, to comments and recommendations included in the May 2, 2013, ACRS letter on WCAP-17116-P, “Westinghouse BWR ECCS Evaluation Model Supplement 5 – Application to ABWR.” The Committee was satisfied with the EDO’s response.
- The Committee considered the EDO’s response of April 29, 2013, to comments and recommendations included in the March 19, 2013, ACRS letter on the draft design specific review standard for mPower iPWR Chapter 7 instrumentation and control systems. The Committee was satisfied with the EDO’s response.

SCHEDULED TOPICS FOR THE 607<sup>th</sup> ACRS MEETING

The following topics are scheduled for the 607<sup>th</sup> ACRS meeting, to be held on September 5-7, 2013:

- Cyber Security Related Activities at the NRC
- Assessment of the Quality of Selected NRC Research Programs - FY 2013
- Monticello Extended Power Uprate Application
- Regulatory Guide 1.79, "Preoperational Testing of Emergency Core Cooling Systems for Pressurized-Water Reactors," and Regulatory Guide 1.79.1, "Initial Test Program of Emergency Core Cooling Systems for New Boiling Water Reactors"
- NRC Staff's Proposed Response to the Staff Requirements Memorandum on SECY 12-0081, "Risk-informed Regulatory Framework for New Reactors"

Sincerely,

*/RA/*

J. Sam Armijo  
Chairman

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

606<sup>th</sup> Full Committee Meeting

July 10, 2013

Date

PLEASE PRINT

	<u>NAME</u>	<u>NRC ORGANIZATION</u>
1	Kathy Halvey Gibson	RES
2	John Jolicœur	OCM
3	Ed Fuller	RES/DSA
4	Jeff Mitman	NRR/DRA
5	David Esh	FSME
6	Chris Grossman	FSME
7	Jim Staffin	FSMF
8	Jim Kennedy	"
9	A. C. Ridge	FSME
10	L. Sheldon Clark	OGC
11	Janelle Jessie	FSME.
12	Rebecca Tadesso	FSME
13	Bohy Eid	FSME
14	DON LOWMAN	FSME
15	Andrea Kocik	OCM/WCO
16	Tim McCartin	NMSS
17	Tina Ghosh	RES/DSA
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