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UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

Mar. 28, 2000

To: Powers, Apostolakis, Larkins, Savio, Larson, Sorensen

From: August W. Cronenberg, ACRS Senior Fellow

Subject: 2nd Quarter FY-2000 Fellow Activities Report

Attached is an updated "table-of-activities" which summarizes my ACRS fellow efforts to date, including efforts this quarter. All primary activities are listed since my joining ACRS in June-95. Efforts this quarter include:

Activities Current Quarter: Jan. 1, 2000 through Mar. 31, 2000

1) Memo AWC-101.2000: FY2000 Proposal related to an assessment of uncertainties in accident assessments for Spent Fuel Pool LOCA events, and evaluate the adequacy of agency understanding of such accidents in support of rule-making activities for decommissioned plants. It is anticipated that this task will constitute the bulk of FY2000 efforts.

2) Memo AWC-102.2000: Follow-up to presentation to ACRS on findings from FY99 review of operational events noted for plants approved for Power Uprates, and assessment of the adequacy of agency uprate review practices.

3) Memo AWC-103.2000: Summary of inquiries to NRR on status of activities on related to the formulation of a Standard Review Plan for Power Uprates.

4) Memo AWC-104.2000: Summary of observations noted from review of staff report on Spent Fuel Pool (SFP) risk assessment for decommissioned plants. Memo constitutes commitments to SFP Review Team (Kress, Powers, Shack, Cronenberg) in preparation for ACRS review of subject at the April 5th, 2000 ACRS meeting. Primary concerns center on inadequacies noted in the source term/consequence analysis, credit for off-site emergency equipment, and arguments/credit for non-physical defense-in-depth measures and industry commitments.

5) Other:
- Attend ACRS Retreat
- Presentations at Feb.-2000 ACRS Meeting:
  - a) Findings/Observations from Power Uprate Review
  - b) Spent Fuel Pool Proposal/Work Scope for FY2000

Anticipated Activities Next Quarter:
- Continue review efforts related to an assessment of uncertainties in analysis of spent fuel pool LOCA events.
- Present power uprate paper at ANS-San Diego meeting (June 4-8, 2000).

ACRS FELLOW STATUS REPORT
August W. Cronenberg

Project Description	Effort	Report	ACRS Use
Performance Period: **2nd Quarter FY2000** (Jan. 1-Mar. 31/2000, ½-time at 6 FTE work weeks)			
1) Outline of Work Scope for FY2000: Assessment of Uncertainties in Spent Fuel Pool LOCA Analysis	1 wk	AWC-101.2000	ACRS Members & Staff
2) Central Observations from Power Uprate Review	1 dy	AWC-102.2000	ACRS Members & Staff
3) Request to NRR on Status of Power Uprate Standard Review Plan	1 dy	AWC-103.2000	ACRS Members & Staff
4) Observations from Review of Staff Risk Assessment on Spent Fuel Pool Accidents for Decommissioned Plants	3 wk	AWC-104.2000	ACRS Members & Staff
5) Other: a) Attend ACRS Retreat: B) Presentations to ACRS: - Assessment of Power Uprate Reviews - Spent Fuel Pool Work Scope for FY2000	2 wk	Slides on File	
Performance Period: **1st Quarter FY-2000** (Oct. 1/99-Dec. 30/99, ½-time at 6 FTE work weeks)			
1) Revisions to Power Uprate Report per ACRS comments (Uhrig, Powers, Savio, Peralta, Sorensen), and submittal to NRR staff for review	3 wk	AWC-106.99	Savio to pass on to NRR Staff
2) Draft-ANS Summary: *Synergistic Safety Issues Related to Reactor Power Uprates*	2 day	AWC-107.99	Savio, Larkins, Powers, Apostolakis, Sorensen
3) Input on International Programs for ACRS Research Report	3 day	AWC-108.99	Wallis, Powers, Apostolakis, El-Zeftawy, Larkins, Savio, Sorensen
4) Finalized Power Uprate Report and ANS Summary	1.5 wk	AWC-109.99	ACRS Members & Staff
Performance Period:			
1)			
2)			
3)			
4)			

Project Description	Effort	Report	ACRS Use
Performance Period: **4th Quarter FY99** (July 1/99-Sept. 30/99, ½-time at 6 FTE work weeks)			
1) **Memo**: Closure Plan for Power Uprate Review Effort	2 day	AWC-105.99	Apostolakis, Powers, Uhrig, Larkins,Savio, Peralta, Sorenson
2) DRAFT: ANS Summary on Power Uprates	1 wk	Draft form	Apostolakis, Powers Larkins, Savio, Sorensen
3) DRAFT: Conference Paper on Power Uprates	2 wk	Draft form	Apostolakis, Powers Larkins, Savio, Sorensen
4) **Other**: 2-Day ADAMS Course Gather Reports on International Research	1 wk	—	Savio
Performance Period: **3rd Quarter** FY99 (Ap. 1/99-June 30/99, ½-time at 6 FTE work weeks)			
1) **Report**: Review of Power Uprate Applications & Potential Synergistic Safety Issues	5.5 wk	AWC-101.99	ACRS & Staff
2) **Other**: ADAMS Survey Course *NR&C News Article-July Issue*	0.5 wk		
Performance Period: **2nd Quarter FY99** (Jan. 1/99-Mar. 31/99; ½-time at 6-FTE work weeks)			
1) **Progress Report**: Work-in-progress report entitled "Review of Power Uprate Applications and Potential Synergistic Safety Issues	3 wk	AWC-101.99	ACRS & Staff
2) **Memo**: Response to Saito Questions to the National Advisory Committees Working Group on High Burnup Fuel	4 day	AWC-102.99	ACRS & Staff
3) **Memo**: Response to Charter Questions for the National Advisory Committee Group on High Burnup Fuels	3 day	AWC-103.99	ACRS & Staff
4) **Memo**: Assist R. Uhrig in several working revisions of the ACRS Research Report	1.5 wk	AWC-104.99	Uhrig, Savio, Larkins
Performance Period: **1st Quarter FY99** (Oct. 1/98-Dec. 30/98, ½-time at 6 FTE work weeks)			
1) **Memo**: Travel Report, Intrn. Mtg. Safety Operating Reactors, paper description and discussion of sessions.	2 dy	AWC-111.98	ACRS & Staff
2) **Memo**: Response to Beal on Japan Aging Paper	2 dy	AWC-112.98	Shack, Seale, Powers, Savio, Dudley, Larkins
3) **Memo**: Draft Research Report to Commission 5 focus areas (PRA, Fuels, I&C, T-H, and Plant Life Extensions).	3.5 wk	AWC-113.98	ACRS & Staff
4) **Paper**: At ANS Mtg. On Safety of Operating Reactors	3 dy		

Project Description	Effort	Report Status	ACRS Use
Performance Period: **4th Quarter FY98** (July 1/98-Sept. 30/98, ½ time at 6 FTE work weeks)			
1) **Memo**: Paper On Nuclear Plant Ageing for the Japan Quadru-Partite Meeting.	2.5 wk	AWC-107.98	ACRS & Staff
2) **Memo**: Final edit of prior draft paper on High Burn-up and Other Fuel Related Safety Issues (AWC-106.98), for the Japan Quadru-Partite Meeting	0.5 wk	AWC-108.98	ACRS & Staff
3) **Viewgraphs**: Viewgraphs for Dr. Seale's presentation of Nuclear Plant Ageing in Japan.	1.0 wk	AWC-109.98	ACRS & Staff
4) **Memo**: FY99 Fellow topics. Suggestions included safety implications for power upgrades, lessons learned from shutdown LERs, and water hammer in auxiliary fluid systems	1.0 wk	AWC-110.98	ACRS & Staff
Performance Period: **3rd Quarter FY98** (April 1/98-June 30/98, ½ time at 6 FTE work weeks)			
1) **Memo**: *draft for comment*, paper on Insights into GSIs from Operating Events, sent to NRC staff and ACRS	2 wk	AWC-104.98	ACRS & Staff, Limited NRC Staff
2) **Memo:** Final paper on *Insights on Generic Safety Issues Noted from Licensee Operating Events"*, for Oct. Topical Mtg. Safety of Operating Reactors, San Francisco	1 wk	AWC-105.98	ACRS & Staff
3) **Memo**: *draft for comment*, ACRS Review of High Burn-up Fuel Safety Issues, paper for Quadru-partite Japan Mtg.	2.5 wk	AWC-106.98	ACRS & Staff
4) ACRS Fuels Subcommittee, Ap 23-24/98	0.5 wk		
Performance Period: **2nd Quarter FY98** (Jan. 1/98-March 31/98, ½ time at 6 FTE work weeks)			
1) **Memo**: Summary of AHP Prioritization effort for research project ranking based on RES and NRR inputs.	1.5 wk	AWC-101.98	ACRS & Staff
2) **Memo**: Follow up memo AWC-101.98, where arguments are made for use of single (safety significance) criteria when using AHP method	1.5 wk	AWC-102.98	ACRS & Staff
3) **Memo**: Proposal for FY98 Fellow activities on fuel issues (high-burn-up, MOX, and Li-Al targets for tritium)	2.5 wk	AWC-103.98	ACRS & Staff
4) Support of ACRS Letter of Mar.16/98: Mechanisms for Addressing Generic Safety Issues	0.5 wk		

Project Description	Effort	Report Status	ACRS Use
Performance Period: **1st Quarter FY 98 (Oct. 1/97 to Dec. 30/97)**			
1) **Memo**: ACRS Fellow Input for ACRS Research Letter to Congress (Outline of Responsibilities)	2 dy	AWC-117.97	ACRS & Staff
2) **Memo**: ACRS Fellow Input Related Theme "NRC Research Needs For a Deregulated Nuclear Power Industry"	1 wk	AWC-118.97	ACRS & Staff
3) **Memo**: Agency Activities on MOX Fuel	1.5 wk	AWC-119.97	ACRS & Staff
4) **Memo**: Travel Report & Presentation at Albuquerque-ANS Meeting (time includes attendance at Meeting)	2 wk	AWC-120.97	ACRS & Staff
5) **Memo**: Assignments for AP600 Review			
6) **Courses**: WordPerfect 6.1 Making the Transition	1 dy		
Performance Period: **4th Quarter FY97 (July 1/97 to Sept. 30/97)**			
1) Slides/presentation for 442nd ACRS Mtg. on AP600 Containment Spray Policy Issues	2 wk	AWC-112.97	ACRS & Staff
2) **Memo**: Pros/Cons on Job Sharing ACRS-Fellow	1 wk	AWC-113.97	Powers, Savio, Larkins
3) **Memo**: GSI-87: Reliability of MOVs in BWR Reactor Water Cleanup Systems	5 wk	AWC-114.97	ACRS & Staff
4) **Memo**: Fellow Contributions to ACRS Review of RES Programs	1 wk	AWC-115.97	ACRS & Staff
5) **Memo**: Review of RES Programs by Fellows	3 wk	AWC-116.97	ACRS & Staff
6) **Courses**: WordPerfect for Windows	2 hr		
Performance Period: **3rd Quarter FY97 (April 1/97 to June 30/97)**			
1) **Memo**: AP600 Design Certification Issues & Schedule for ACRS Hearings	2 wk	AWC-107.97	ACRS Members & Staff
2) **Memo**: Response to Dave Williams Letter on Resolution of Direct Containment Heating Issues	4 wk	AWC-108.97	Kress, Seale, Larkins, Savio Sherry
3) **Memo**: on Overview of AP600 Containment Spray Policy Issues	3 wk	AWC-109.97	ACRS Members & Staff
4) **Paper Summary**: for ANS-Albuquerque Mtg: Insights into Generic Issues Noted from Operational Events	0.5 wk	AWC-110.97	Powers, Sherry Larkins, Savio
5) **Memo**: Overview of High Burn-up Fuels Issues for ACRS Fuels Subcommittee	3.5 wk	AWC-111.97	ACRS & Staff

Performance Period: **2nd Quarter FY97** (Jan. 1/97 to Mar. 30/97)			
1) **Memo**: Comments on Power's memo on High Burn-up Fuel Issues	1 wk	AWC-101.97	ACRS & Fuels Subcommittee
2) **Memo**: Comments on INPO Report on operational problems with high burn-up cores	2 wk	AWC-102.97	ACRS & Fuels Subcommittee
3) **Memo**: Comments on ACRS Draft Letter on Risk for Low-Power & Shutdown Conditions	1 wk	AWC-103.97	ACRS & Staff
4) **Memo**: ACRS Annual Report to Congress	1 wk	AWC-104.97	ACRS & Staff
5) **Memo**: Insights into the Generic Issues Program from Operational Events	8 wk	AWC-105.97	ACRS & Staff
6) **Memo**: Safety Issues on Tritium Production	2 wk	AWC-106.97	ACRS & Staff
7) Courses/Prof. Development - None this quarter			

Performance Period: **1st Quarter FY97** (Oct. 1/96 to Dec.30/96)			
1) **Travel Report**: PSA-96 Topical Mtg.	1 wk	AWC-109.96	ACRS & Staff
2) **Memo**: ACRS Concerns per EPRI Letter on AP600 Policy Issues	2 wk	AWC-110.96	ACRS & Staff
3) **Memo**: NRR Resolution per EPRI Letter on AP600 Policy Issues (SECY-96-128)	1 wk	AWC-111.96	ACRS & Staff
4) **Memo**: Insights into Generic Issues Program from Licensee Operating Reports (LERs)	4 wk	AWC-XXX.96	ACRS & Staff
5) **Courses**: PRA-IRRAS Code Basics	4 dy	Dec. 10-13	

Project Description	Effort	Report Status	ACRS Use
Performance Period: 4th Quarter FY96 (July 1/96 to Sept. 30/96)			
1) **Memo**: AP600 Design Review Issues (Memo:AWC-106.96) for AP600 Subcommittee Meeting of 7/19/96	2 wk	AWC-106.96	West-AP600 Subcommittee
2) **Memo**: Changes to System-80+ Design Documentation	2 wk	AWC-107.96	ALWR/Sys-80+ Subcommittee
3) **Memo**: AP600 Aerosol Depletion Considerations, With and Without Sprays	7 wk	AWC-108.96	ACRS & Staff
4) **Slides**: Overhead-slides for PSA-96 Paper (Park City, Sept 30-Oct 3/96)	1 wk		
5) Courses/Prof. Development - None			
Performance Period: 3rd Quarter FY96 (Apr. 1/96 to June 30/96)			
1) **Memo**: Summary for LWR Fuels Meeting (Portland, Mar-97): Analysis of High Burn-up Fuel Behavior During LOCA, PCM, and Operational Transients"	1 wk	AWC-102.96	Reactor Fuels Subcommittee
2) **Memo**: Draft Report: High Burn-up Fuel Behavior During Simulated LOCAs	3 wk	AWC-103.96	Reactor Fuels Subcommittee
3) **Paper**: "Multiple System Responses and Interaction Issues: Adequacy of Treatment in IPE/IPEEEs	2 wk	AWC-104.96	Reactor Fuels Subcommittee
4) **Memo**: Analysis of Control Rod Insertion Problems Noted in High Burn-up Assemblies	2 wk	AWC-105.96	Reactor Fuels Subcommittee
5) **Memo**: NRC Staff and Westinghouse Positions on AP600 Design Review Issues	3 wk	AWC-106.96	ALWR/AP600 Subcommittee
6) **Courses/Prof. Development** - UNIX C, C++, Fortran, 4/15-17 - Ethics Training, 4/22 - Human Reliability, 5/15-17 - Advanced Harvard Graphics, 6/26	 3 dy 2 hr 3 dy 1 dy		

Project Description	Effort	Report Status	ACRS Use
Performance Period: **2nd Quarter FY96** (Jan. 01/96 to Mar. 30/96)			
1) **Memo**: Fellow Proposal on Safety Implications of High Burn-up Fuel Performance Under LOCA Conditions	1 wk	AWC-101.96	Reactor Fuels Subcommittee
2) **Memo**: Observations from Review of Multiple System Responses Program (MSRP)	2 wk	Letter: 12/96	ACRS & Staff
3) Install/Run FRAPCON & FRAPT6 codes on ACE3-Sun	3 wk	---	Reactor Fuels Subcommittee
4) Perform test runs with codes to high burn-up (80 MWD/kg-U) fuel conditions	4 wk	---	Reactor Fuels Subcommittee
5) **Courses/Prof. Development:** - UNIX-Getting Started (Self-paced) - Internet: Fact & Fiction - Applied Statistics - Beginning Federal Service, 2/13 - UNIX The Basics, 3/18-19	 2 hr 2 hr 1 wk 1 dy 2 dy		
Performance Period: **1st Quarter FY96** (Oct. 1/95 to Dec. 30/95)			
1) Review/report to ACRS members on proposed resolution of Multiple System Responses Program (MSRP)	8 wk	Draft	ACRS & Staff
2) Draft ACRS letter on MSRP, prepare 22 overhead slides for committee presentation	2 wk	ACRS-Letter (Draft)	ACRS & Staff
3) **Summary**: 1000 word summary for conference paper on results of MSRP investigation (PSA-96, Park City, Ut, Sept-96)	1 wk	Summary for Conf. Paper	
4) Courses/Prof. Development - Harvard Graphics for Windows - PRA Basics for Reg. Application	 1 dy 3 dy		
Performance Period: **4th Quarter FY95** (June 12/95 to Sept. 30/95)			
1) **Memo**: Safety Implications Related to High Burn-up Fuel Performance	8 wk	AWC-101.95	Reactor Fuels Subcommittee
2) **Bibliography**: Mixed-oxide Fuels (for support of NRC/DOE feasibility studies for burning of weapons-grade Pu in commercial reactors)	2 wk	AWC-102.95	Reactor Fuels Subcommittee
3) Attend/report on Steam Explosion Review Group Meeting (SERG-2), Annapolis, MD, 6/15-16/95	2 wk	Letter: 6/30/95	ACRS & Staff
4) **Memo**: Observations from high burn-up fuel contractor (PNL) status meeting of 7/12/95	½ wk	AWC-103.95	ACRS & Staff
5) **Memo**: Summary of ACRS office team building efforts	½ wk	AWC-104.95	ACRS-Staff
6) Courses: - Windows-3.1 - WordPerfect-6.1 Windows	1 dy 1 dy		