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Your ref: Project Number 740
Our ref: DCP/NRC1983

August 23, 2007

Subject: AP1000 COL Standard Technical Report Submittal of APP-GW-GLR-040, Revision 1

In support of Combined License application pre-application activities, Westinghouse is submitting Revision 1 of AP1000 Standard Combined License Technical Report Number 70. The purpose of Technical Report 70 is to close combined operating license (COL) Information Item 18.9-1 for "Procedure Development" which is delineated in Design Control Document (DCD) Section 18.9.1 (Reference 1 in the report). In addition, this Technical Report also supports partial closure of COL Information Item 13.5-1, as delineated in DCD Table 1.8-2.

Subsequent to the submission of Revision 0 of this Technical Report to the NRC, a meeting was held between the NRC and Westinghouse to discuss procedure development issues related to the AP1000 design and to allow the NRC an opportunity to audit a variety of the AP1000 Operations Procedures. This Revision to Technical Report 70 addresses issues discussed in this meeting as well as the NUREG 0711 concerns that were discussed and later delineated in the NRC letter, "Summary of the April 11 and 12, 2007 meeting to discuss AP1000 Plant Operating Procedures," dated May 11, 2007.

This report is submitted as part of the NuStart Bellefonte COL Project (NRC Project Number 740). The information included in this report is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification. The DCD Revisions included in this revision to Technical Report 70 have been included in Revision 16 of the DCD.

The purpose for submittal of this report was explained in a March 8, 2006 letter from NuStart to the NRC.

Pursuant to 10 CFR 50.30(b), APP-GW-GLR-040, Revision 1, "Plant Operations, Surveillance, and Maintenance Procedures," Technical Report Number 70, is submitted as Enclosure 1 under the attached Oath of Affirmation.

It is expected that when the NRC review of Technical Report Number 70 is complete, the changes to the AP1000 DCD identified in Technical Report 70 will be considered approved generically for COL applicants referencing the AP1000 Design Certification. To facilitate the review of Technical Report 70, the following documents are provided for review, by appointment, in the Westinghouse office in Rockville, Maryland:

- 1) APP-GW-GJP-100, AP1000 Normal Operating Procedures (NOP) Writer's Guideline, Revision G, and
- 2) APP-GW-GJP-200, AP1000 Writer's Guideline for Two Column Procedures, Revision D.

Questions or requests for additional information related to content and preparation of this report should be directed to Westinghouse. Please send copies of such questions or requests to the prospective applicants for combined licenses referencing the AP1000 Design Certification. A representative for each applicant is included on the cc: list of this letter.

Westinghouse requests the NRC to provide a schedule for review of the technical report within two weeks of its submittal.

Very truly yours,

Mont D Bartley FOR

A. Sterdis, Manager
Licensing and Customer Interface
Regulatory Affairs and Standardization

/Attachment

1. "Oath of Affirmation," dated August 23, 2007

/Enclosure

1. APP-GW-GLR-040, Revision 1, "Plant Operations, Surveillance, and Maintenance Procedures," Technical Report Number 70

| | | | | |
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ATTACHMENT 1

“Oath of Affirmation”

ATTACHMENT 1
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of:)
NuStart Bellefonte COL Project)
NRC Project Number 740)

APPLICATION FOR REVIEW OF
"AP1000 GENERAL COMBINED LICENSE INFORMATION"
FOR COL APPLICATION PRE-APPLICATION REVIEW

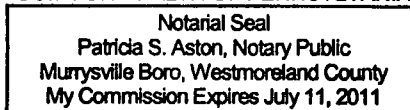
W. E. Cummins, being duly sworn, states that he is Vice President, Regulatory Affairs & Standardization, for Westinghouse Electric Company; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission this document; that all statements made and matters set forth therein are true and correct to the best of his knowledge, information and belief.



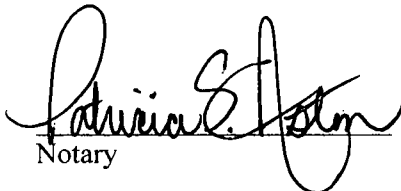
W. E. Cummins
Vice President
Regulatory Affairs & Standardization

Subscribed and sworn to
before me this 23rd day
of August 2007.

COMMONWEALTH OF PENNSYLVANIA



Member, Pennsylvania Association of Notaries


Notary

ENCLOSURE 1

APP-GW-GLR-040, Revision 1

“Plant Operations, Surveillance, and Maintenance Procedures”

Technical Report 70

AP1000 DOCUMENT COVER SHEET

TDC: _____ Permanent File: _____ APY: _____
 RFS#: _____ RFS ITEM #: _____

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|---------------------------------------|-------------------|--------------|-----------------------|
| AP1000 DOCUMENT NO. APP-GW-GLR-040 | REVISION NO. 1 | Page 1 of 26 | ASSIGNED TO W-LONG |
|---------------------------------------|-------------------|--------------|-----------------------|

ALTERNATE DOCUMENT NUMBER: TR 70 WORK BREAKDOWN #: GW

ORIGINATING ORGANIZATION: Westinghouse Electric Company

TITLE: Plant Operations, Surveillance, and Maintenance Procedures

| | |
|---------------------------------|--------------------------------------------------------|
| ATTACHMENTS: | DCP #/REV. INCORPORATED IN THIS DOCUMENT REVISION: N/A |
| CALCULATION/ANALYSIS REFERENCE: | |

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| PATENT REVIEW | <i>M. Corletti</i> | SIGNATURE/DATE | <i>M.M. Corletti</i> 8/23/07 |

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| REVIEWERS Andrea Sterdis | SIGNATURE/DATE <i>Monk D. Bentley FOR</i> 8/17/07 | |
| VERIFIER S. W. Long | SIGNATURE/DATE <i>Stewart W. Long</i> 8/17/07 | VERIFICATION METHOD Page by page |
| AP1000 RESPONSIBLE MANAGER <i>FOR</i> F. L. Carpentino | SIGNATURE* <i>Stewart W. Long</i> | APPROVAL DATE 8/17/07 |

* Approval of the responsible manager signifies that document is complete, all required reviews are complete, electronic file is attached and document is released for use.

APP-GW-GLR-040
Revision 1

Westinghouse Non-Proprietary Class 3

August 2007

AP1000 Standard Combined License Technical Report

Plant Operations, Surveillance, and Maintenance Procedures

Westinghouse Electric Company LLC
Nuclear Power Plants
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Pittsburgh, PA 15230-0355

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Plant Operations, Surveillance, and Maintenance Procedures

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APPENDIX A LIST OF DOCUMENTS FOR EMERGENCY OPERATING PROCEDURES
(3 pages)

APPENDIX B LISTS OF DOCUMENTS FOR NORMAL OPERATING PROCEDURES
(NOPS) AND ABNORMAL OPERATING PROCEDURES (AOPs) (7 pages)

1.0 INTRODUCTION

1.1 Purpose

The primary purpose of this Technical Report is to close combined license (COL) Information Item 18.9-1 for "Procedure Development" which is delineated in Design Control Document (DCD) Section 18.9.1 (Reference 1). In addition, this Technical Report also supports partial closure of COL Information Item 13.5-1, as delineated in DCD Table 1.8-2. This Technical Report will address these issues by describing methodology, criteria and schedules for procedure development. Methodology and criteria for procedure development is contained in the Westinghouse Writer's Guidelines for the Normal Operating and Two-Column Format Procedures which have been submitted for NRC review. The procedure guidance delineated in these Writer's Guidelines, which incorporates industry and regulatory standards for the development process and the human factors requirements for nuclear power plant procedures, provides the basis for generating the procedures necessary for the conduct of human factors evaluation work and plant operations. The list of procedures developed or planned for development is included in Appendices A and B, and their availability is delineated in Table 2.2 below. Following the successful and satisfactory review of the procedures delineated in Phases 1 and 2 of Table 2.2, it is anticipated that COL Information Item 18.9-1 will be closed and COL Information Item 13.5-1 will be partially closed in accordance with section 5.0 of this Technical Report.

In the DCD, COL Information Item 18.9-1 is delineated in Section 18.9.1, and is stated as follows:

"18.9.1 Combined License Information

See Section 13.5 for a discussion of the responsibility for procedure development."

This Technical Report also acknowledges the acceptance of the AP600 Emergency Response Guidelines (ERGs) as delineated in Section 18.9.3 of the AP1000 Final Safety Evaluation Report and addresses the development of procedures as required by DCD Section 13.5.1. Additional issues associated with COL Item 13.5-1 as delineated in DCD Table 1.8-2 will be addressed in future licensing submittals.

In the AP1000 DCD (Reference 1) Section 13.5.1, COL item "Plant Procedures", references WCAP-14690, Revision 1, "Designer's Input to Procedure Development for the AP600," issued June 1997, which provides common guidelines for the COL applicant developing plant operating procedures and includes information on the development and design of the AP1000 emergency response guidelines and emergency operating procedures. In the DCD (Reference 1) Section 13.5.1, the "Combined License Information Item" requires the COL applicant referencing the AP1000 Certified Design to address plant procedures, including the AP1000 ERGs and emergency operating procedures. While the emergency response guidelines have been prepared to support

preparation of the emergency operating procedures, the emergency response guidelines do not need to be controlled or issued as COL deliverables.

COL Information Item 13.5-1 as delineated in Section 13.5.1 of the DCD reads as follows:

“13.5.1 Combined License Information Item

Combined License applicant referencing the AP1000 certified design will address plant procedures including the following:

- normal operation
- abnormal operation
- emergency operation
- refueling and outage planning
- alarm response
- maintenance, inspection, test, and surveillance
- administration
- operation of post-72-hour equipment”

As discussed below, addressing the procedural requirements indicated in Section 13.5.1 of the DCD for selected procedures needed for Human Factors efforts facilitates closure of COL Information Item 18.9-1 and partial closure of COL Information Item 13.5-1.

This Technical also Report addresses:

- Bullets 3 and 4 of Criterion 2 in Section 9.4 of Revision 2 of NUREG-0711.
- Criterion 7 in Section 9.4 of Revision 2 of NUREG-0711 concerning the impact of computer-based procedures.
- Criterion 9 in Section 9.4 of Revision 2 of NUREG-0711 concerning the accessibility of procedures in the AP1000 Control Room.

1.2 Detailed Scope for COL Information Items 18.9-1 and 13.5-1

“Operating Procedures” comprise the Emergency Operating Procedures (EOPs), Normal Operating Procedures (NOPs), and Abnormal Operating Procedures (AOPs) as well as refueling and outage planning, alarm response, maintenance, inspection test and surveillance, and operating of post-72 hour equipment procedures. Section 2 further breaks down the scope of these procedure groups.

Writer’s Guidelines have been developed which control the preparation of NOPs and Two-Column Format Procedures. As preparation of the remaining procedures begins, such as maintenance and surveillance procedures, appropriate writer’s guidelines will similarly be prepared. The Writer’s Guidelines establish programmatic guidelines.

Details of the revision of DCD Section 13.5 are provided in this submittal, as well as a description of the additional information necessary to complete closure of COL Information Item 13.5-1. COL Information Item 18.9-1 refers to Section 13.5 of the DCD for responsibility of procedure development and to facilitate procedure development for Human Factors engineering activities. The criteria and methodology for procedure development is described in this technical report and in Westinghouse Writer's Guidelines, and Human Factors-related procedures have been developed or will be developed in accordance with these criteria/guidelines and the schedule in Table 2.2 of this technical report.

1.3 Project Scope

EOPs, NOPs, and AOPs per DCD Section 13.5 are being developed by Westinghouse (WEC). This technical report documents the development process. Selected EOPs, NOPs, and AOPs are being prepared with an initial emphasis on a selective set of operating procedures necessary to support Human Factors simulator testing and task analysis. In addition to these procedures, the project scope encompasses EOPs, and AOPs and those NOPs which support specific EOP operator control room actions.

1.4 Procedure Standardization

The overall goal is to develop procedures integrating industry best practices and standards. To facilitate these goals, Westinghouse has developed Writer's Guidelines in collaboration with the plant operator which incorporate industry and regulatory standards for the procedure development process and human factors requirements for nuclear power plant procedures. Industry Lessons Learned have been incorporated into the AP1000 Procedures Program, as delineated in Writer's Guidelines. In addition, standards and guidance from the NRC and industry organizations such as INPO and NEI have been incorporated into the program for procedure development. Finally, the AP1000 Procedure Program utilized specific experience and examples from a population of industry procedures and writer's guidelines as a starting point for the development of the program.

These Writer's Guidelines, and the procedures developed based on them, are part of the AP1000 Standardized Design and are applicable to COL applications referencing the AP1000 DCD.

1.5 Closure of COL Information Item 18.9-1 and Partial Closure of COL Information Item 13.5-1

This technical report:

- (1) does not result in any regulatory impacts,
- (2) does not affect severe accident criteria, and
- (3) will not alter security requirements.

The NRC will have the option to review AP1000 guidelines and procedures at the Westinghouse design office. Based on these reviews and the Westinghouse-NuStart programmatic process to prepare plant procedures as described in this technical report, the NRC is requested to consider COL Information Item 18.9-1 closed, and to consider COL Information Item 13.5-1 partially closed as delineated in Section 5.0 of this Technical Report.

2.0 TECHNICAL BACKGROUND

2.1 Overview

A project plan has been prepared to manage the writing, review, and approval of AP1000 operating procedures as related to COL Information Items 13.5-1 and 18.9-1. The plan uses a definition of tasks based on a work breakdown structure (WBS) for the procedure preparation process. The current plan is further described in Sections 2.2 through 2.5 below.

2.2 Integrated Master Plan

The highest level of the current WBS for procedures is the Integrated Master Plan for major deliverables as shown below. Except for EOPs as discussed previously, plant procedures will be draft revisions when prepared and will become final documents at the customer's plant site. The current WBS has organized the development of AP1000 Procedures into three phases as delineated in Table 2.2 below.

Phase 1: Development of 3 EOPs, 15 NOPs and 2 AOPs to support the second phase of Human Factors Testing for Control Room Design Finalization in the AP1000 Simulator.

Phase 2: Development of 20 additional EOPs, a set of 9 NOPs, and 1 Surveillance Test to support Operational Task Analysis (OSA-1) for the AP1000.

Phase 3: Development of the remaining procedures and guidelines. This currently includes 12 EOPs as well as additional supporting EOP documentation, 20 NOPs which support specific EOP operator control room actions, the remaining 43 of the 45 total AOPs, and the Post-72 Hour Procedures. In addition, and of lower priority, Phase 3 will include the development of the remaining 47 NOPs, which do not support specific EOP operator control room actions, as well as:

Maintenance Guidelines,
Surveillance Guidelines,
Refueling and Outage Procedures,
Alarm Response Guidelines,
Administrative Guidelines, and
Operation of Post-72 Hour Procedures.

Surveillance Guidelines also address inspection and testing procedural issues associated with surveillance testing. Phase 3 Procedure Activities are expected to occur after the COL Licensing Process and are dependent upon program funding and work priorities.

Table 2.2: Current Integrated Master Plan

| Phase 1 Procedures --- WEC Engineering Office Human Factors/ Simulator Development Support | |
|-------------------------------------------------------------------------------------------------------------|-----------|
| ◇ Emergency Operating Procedures (3 total) | Completed |
| ◇ Draft Normal Operating Procedures (15 total) | Completed |
| ◇ Draft Abnormal Operating Procedures (2 total) | Completed |
| Phase 2 Procedures --- WEC Engineering Office Operational Task Analysis (OSA-1) Support | |
| ◇ Emergency Operating Procedures (20 total) | Completed |
| ◇ Draft Normal Operating Procedures, (9 total) | Completed |
| ◇ Draft Surveillance Test Procedures, (1 total) | Completed |
| Phase 3 Procedures and Guidelines --- WEC Engineering Office Remaining Procedures and Guidelines | |
| ◇ Remaining Emergency Operating Procedures (12 total) | |
| ◇ Draft Normal Operating Procedures which support specific EOP actions (20 total) | |
| ◇ Draft Abnormal Operating Procedures (43 total) | |
| ◇ Draft Post-72 Hour Procedures (estimate 15 total) | |
| ◇ Remaining Draft Normal Operating Procedures (47 total) | |
| ◇ Maintenance Guidelines (estimated 150 total) | |
| ◇ Surveillance Guidelines (estimated 200 total) | |
| ◇ Draft Refueling & Outage Procedures (estimated 50 total) | |
| ◇ Alarm Response Guidelines (estimated 3000 total) | |
| ◇ Administrative Guideline (1 total) | |

2.3 Lists of Documents

Appendix A provides a list of documents for EOPs. Appendix B provides a list of documents for NOPs and AOPs. The Phase 1 and Phase 2 Procedures are available for NRC review at the Westinghouse offices in Monroeville, Pennsylvania at the Staff's convenience.

2.4 Description of Work Breakdown Structure (WBS)

The WBS has been developed using a three level model. The starting point is level 1 which comprises a list of the major procedure groups as noted in Table 2.2. Each procedure group is broken down into a level 2 list of procedures. Lastly, each procedure is defined by level 3 development subtasks. This approach follows industry standard project management methods, but incorporates some innovative techniques to monitor performance metrics. The goal of the project plan implementing this WBS is to continuously track the procedure deliverables to maintain high quality and to complete them on a schedule to support NRC and customer requirements.

2.5 Procedure Development Process

The procedure development process follows the requirements delineated in the applicable AP1000 Writer's Guidelines. As discussed in Section 1.2 above, the Writer's Guidelines establish programmatic guidelines for AP1000 Operating Procedure development as well as the process for the:

- Preparation of AP1000 Operating Procedures
- Review of AP1000 Operating Procedures
- Approval of AP1000 Operating Procedures

Personnel developing AP1000 Operating Procedures are qualified in accordance with classroom training and Computer-Based Training, which address:

- Procedure Writing
- The AP1000 Procedure Writer's Guidelines
- AP1000 Administrative Processes, and
- AP1000 Systems and Design

In addition, the AP1000 procedure development process incorporates applicable industry, NRC, INPO and NEI standards with respect to the qualifications of the procedure writers and the qualified users. These standards are incorporated explicitly or by reference in the applicable Writer's Guidelines (References 6 and 7).

2.6 Basis for Procedure Development

This section explicitly addresses Bullets 3 and 4 of Criterion 2 in Section 9.4 of Revision 2 of NUREG-0711, "Human Factors Engineering Program Review Model".

The Westinghouse Emergency Response Guidelines (ERGs) provide functional guidelines for terminating accidents and transients that affect plant safety. The ERGs contain the technical basis for constructing the Emergency Operating Procedures (EOPs). The Two-column format used to present the ERGs contains rules of usage which

supplement the technical instructions. The Background Documents, which are presented separately from the guidelines, contain additional detail about each operator action step which may affect how the EOPs are written or presented in training.

Similarly, the Westinghouse Owner's Group Abnormal Response Guidelines (ARGs) provide functional guidelines for terminating abnormal operating conditions. The ARGs contain the technical basis for constructing the Abnormal Operating Procedures (AOPs). The Two-column format used to present the ARGs contains rules of usage which supplement the technical instructions and are delineated in the AP1000 Writer's Guideline for Two Column Procedures. Like the EOPs, the AOPs have associated Background Documents, which contain additional detail about each operator action step that may affect how the AOPs are written or presented in training

The EOPs and AOPs are developed using the functional guidelines in a presentation philosophy that directs the operating staff to provide timely implementation. The presentation of the EOPs and AOPs is controlled by the rules the AP1000 Writer's Guideline for Two Column Procedures which implements the functional guidance provided. The ERGs and ARGs do not specify the degree of automated plant response nor the degree of user control over the pace of working through the accident response. The task allocation between the operator and the computer will be decided when designing the features of the Human System Interface (HSI).

In addition, there are task analyses which provide the functional bases for the operator actions and tasks in the EOPs, AOPs and Normal Operating Procedures (NOPs). For functions which are consistent with current plants and systems, the bases for these is NUREG-1122 Rev. 2, "Knowledge and Abilities Catalog for Nuclear Power Plant Operators: Pressurized Water Reactors" or NUREG-1123 Rev. 2, "Knowledge and Abilities Catalog for Nuclear Power Plant Operators: Boiling Water Reactors". For tasks which are AP1000-specific, the bases are developed in the AP1000 Tasks Analysis program. The AP1000 Function-based task analysis has been completed as documented in APP-GW-GLR-081. Additional information concerning the results of this task analysis can be found in APP-OCS-J1R-110, Rev. 0 "Operational Sequence Analysis Methodology" and APP-OCS-J1R-120, Rev. 0 "AP1000 Operational Sequence Analysis (OSA-1) Summary Report".

2.7 Impact of Computerized Procedures and Accessibility

This Section explicitly addresses Criterion 7 and 9 in Section 9.4 of Revision 2 of NUREG-0711, "Human Factors Engineering Program Review Model".

Discussions of the impact of the Computerized Procedure System (CPS) on plant operations are contained in WCAP-14645-NP, Rev. 3 "Human Factors Engineering Operating Experience Review Report for the AP1000 Nuclear Power Plant" as well as APP-OCS-T2R-020, Rev. 0 "AP1000 Engineering Tests Phase 1 Test Report".

Comments from operations personnel involved in Human Factors testing of the AP1000 control room design, and specifically the Computerized Procedure System, have been generally favorable. For instance, it has been noted that the ability to scroll through the procedure text and the detailed place-keeping features provided by CPS, particularly across multiple procedures, is very helpful. One of the primary advantages of CPS over paper-based procedures is that the computer can easily monitor step conditions while they are applicable. This context-sensitive alerting function resolves one of the fundamental sources of workload and error that characterize the use of paper-based operating procedures. Termination criteria are one such case of initiated steps that must be monitored for completion.

Procedures will be accessible in the AP1000 Control Room through the CPS as well as by hardcopy as a back-up to the CPS as a resource. Details of the explicit design and implementation of these means of procedure support for the operations staff will be confirmed in the final Human Factors Engineering verification and validation process.

2.8 Writer's Guidelines

The AP1000 Writer's Guideline for Two-Column Format, which addresses EOPs and AOPs (Reference 6) as well as the AP1000 NOP Writer's Guideline (Reference 7) are available for NRC review. These Writer's Guidelines and the procedures developed based on them are part of the AP1000 Standardized Design and are applicable to the COL applications referencing the AP1000 DCD.

3.0 REGULATORY IMPACT

3.1 Applicable Sections of the NRC's Final Safety Evaluation Report

Sections 13.5 and 18.9 are the portions of the NRC's FSER related to the COL Information Items covered by this report. However, these sections are not impacted by this Technical Report.

3.2 Severe Accident Change Criteria

There are no proposed departures from Tier 2 that would affect resolution of a severe accident issue identified in the DCD. Therefore no license amendment is required.

Normal Operating Procedures are executed within the established Technical Specifications.

Abnormal and Emergency Operating Procedures conform to industry standards and are written in compliance with the applicable regulatory requirements. These procedures provide the response to abnormal or accident conditions to bring the plant to a condition as prescribed by the Technical Specifications.

As such, there are no changes that have an impact on the Severe Accident Criteria.

3.3 Security

The closure of COL Information Item 18.9-1, and the partial closure of COL Information Item 13.5-1, will not alter barriers or alarms that control access to the protected areas of the plant. The closure of these COL Information Items will not alter requirements for security personnel. Therefore, the closure of these COL Information Items does not have an adverse impact on the security assessment of the AP1000.

4.0 REFERENCES

1. APP-GW-GL-700, Revision 15, AP1000 Design Control Document.
2. NUREG-1793, Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design, September 2004.
3. NEI 04-01, Revision D, DRAFT Industry Guideline for Combined License Applicants Under 10 CFR Part 52, October 5, 2005.
4. SECY-05-0197, Review of Operational Programs in a Combined License Application and Generic Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria, Policy Issue Notation Vote, October 28, 2005.
5. APP-GW-GL-027, "Framework for AP1000 Severe Accident Management Guidance", Revision 0, April 2006. Alternate Document Number: WCAP-16335.
6. APP-GW-GJP-200, Revision D, AP1000 Writer's Guideline for Two-Column Procedures.
7. APP-GW-GJP-100, Revision G, AP1000 Normal Operating Procedures (NOP) Writer's Guideline.
8. APP-GW-GLR-081, Rev. 0, Closure of COL Information Item 18.5-1, Task Analysis.
9. APP-OCS-JIR-110, Rev. 0, Operational Sequence Analysis Methodology.
10. APP-OCS-JIT-120, Rev. 0, AP1000 Operational Sequence Analysis (OSA-1) Summary Report.
11. WCAP-14645-NP, Rev. 3, Human Factors Engineering Operating Experience Review Report for the AP1000 Nuclear Power Plant.
12. APP-OCS-T2R-020, Rev. 0, AP1000 Engineering Tests Phase 1 Test Report.
13. Westinghouse Owners Group, Writers Guide for Emergency Response Guidelines, HP/LP - Revision 2, April 30, 2005.
14. NUREG-0711 Revision 2, "Human Factors Engineering Program Review Model"

5.0 DCD MARKUP

The following DCD Mark-Ups identify how the DCD Section 13.5.1 will be revised:

13.5.1 Combined License Information Item

The Combined License information requested in this subsection has been partially addressed in APP-GW-GLR-040, Revision 1 (Reference 10), and the applicable changes are incorporated into the DCD. No additional work is required by the Combined Operating License Applicant to address the aspects of the Combined License information requested in this subsection as delineated in the following paragraph:

The process to manage the development, review and approval of AP1000 Normal Operating, Abnormal Operating, Emergency Operating, Refueling and outage planning, Alarm response, Administrative, Maintenance, Inspection, Test and Surveillance Procedures as well as the procedures which address the operation of post-72 hour equipment is delineated in APP-GW-GLR-040, Revision 1. In addition, APP-GW-GLR-040 submitted to the NRC the Writer's Guidelines for Normal Operating and Two-Column Format Procedures, APP-GW-GJP-100 and APP-GW-GJP-200 respectively.

The Combined Operating License Applicant will address Operational and Maintenance Programmatic issues, as well as training in the AP1000 COL licensing process.

The following words represent the original Combined Operating License Information Item commitment.

Combined License applicants referencing the AP1000 certified design will address plant procedures including the following:

- Normal operation
- Abnormal operation
- Emergency operation
- Refueling and outage planning
- Alarm response
- Maintenance, inspection, test and surveillance
- Administrative
- Operation of post-72 hour equipment

References:

10. APP-GW-GLR-040, Plant Operations Maintenance and Surveillance Procedures, Revision 1.

The following DCD markups identify how the AP1000 DCD will be modified for Section 18.9.1.

Revise Section 18.9 as follows:

18.9.1 Combined License Information

The Combined License information requested in this subsection has been fully addressed in APP-GW-GLR-040, (Reference 2), and the applicable changes are incorporated into the DCD. No additional work is required by the Combined Operating License Applicant to address the aspects of the Combined License information requested in this subsection.

The following words represent the original Combined Operating License Information Item commitment, which has been addressed as discussed above.

See Section 13.5 for a discussion of the responsibility for procedure development.

18.9.2 References

2. APP-GW-GLR-040, "Plant Operations, Surveillance, and Maintenance Procedures," Westinghouse Electric Company LLC.

APPENDIX A

LIST OF DOCUMENTS FOR EMERGENCY OPERATING PROCEDURES

(3 pages including this page)

TABLE A-1**Listing of EOP Documents**

The following list shows EOP documents being developed as Phase 1 (Human Factors / Simulator Development Support), Phase 2 (Operational Task Analysis Support) and Phase 3 (Remaining Procedures and Guidelines)

NOTE: This list does not include estimated 12 Severe Accident Management Guidelines (SAMGs). This Technical Report does not address SAMG development. The structure of the AP1000 SAMGs has been developed and is available in Reference 5, APP-GW-GL-027.

| Procedure Title | Procedure Number |
|--------------------------------------------------------------------------------------------------------|-------------------------|
| <u>Emergency Operating Procedures -- Human Factors/ Simulator Development Support (Phase 1)</u> | |
| TOTAL 3 PROCEDURES | |
| 1. E-O Reactor Trip or Safety Injection | APP-GW-GJP-201 |
| 2. E-3 SG Tube Rupture | APP-GW-GJP-204 |
| 3. ES-0.1 Reactor Trip Response | APP-GW-GJP-206 |
| <u>Emergency Operating Procedures -- Operational Task Analysis (OSA-1) Support (Phase 2)</u> | |
| TOTAL 20 PROCEDURES | |
| 1. E-1 Loss of Reactor or Secondary Coolant | APP-GW-GJP-202 |
| 2. E-2 Faulted SG Isolation | APP-GW-GJP-203 |
| 3. ECA-1.1 LOCA Outside Containment | APP-GW-GJP-205 |
| 4. ES-0.2 Natural Circulation Cooldown | APP-GW-GJP-207 |
| 5. ES-1.1 Passive Safety System Termination | APP-GW-GJP-208 |
| 6. ES-1.2 Post LOCA Cooldown and Depressurization | APP-GW-GJP-209 |
| 7. FR-C.1 Response to Inadequate Core Cooling | APP-GW-GJP-210 |
| 8. FR-C.2 Response to Degraded Core Cooling | APP-GW-GJP-211 |
| 9. FR-C.3 Response to Saturated Core Cooling | APP-GW-GJP-212 |
| 10. FR-H.1 Response to Loss of Heat Sink | APP-GW-GJP-213 |
| 11. FR-H.2 Response to Steam Generator Overpressure | APP-GW-GJP-214 |
| 12. FR-H.3 Response to Steam Generator High Level | APP-GW-GJP-215 |
| 13. FR-H.4 Response to Loss of Normal Steam Release Capabilities | APP-GW-GJP-216 |
| 14. FR-H.5 Response to Steam Generator Low Level | APP-GW-GJP-217 |
| 15. FR-I.1 Response to High Pressurizer Level | APP-GW-GJP-218 |
| 16. FR-I.2 Response to Low Pressurizer Level | APP-GW-GJP-219 |
| 17. FR-I.3 Response to Voids in Reactor Vessel | APP-GW-GJP-220 |

| Procedure Title | Procedure Number |
|------------------------------------------------------------------|-------------------------|
| 18. SDP-1 Response to Loss of RCS Inventory During Shutdown | APP-GW-GJP-231 |
| 19. SDP-2 Response to Loss of RNS During Shutdown | APP-GW-GJP-232 |
| 20. SDP-3 Response to High Containment Radiation During Shutdown | APP-GW-GJP-233 |

Remaining Emergency Operating Procedures – (Phase 3)

TOTAL 12 PROCEDURES

| | |
|--------------------------------------------------------------------------|----------------|
| 1. FR-P.1 Response to Imminent Pressurized Thermal Shock Conditions | APP-GW-GJP-221 |
| 2. FR-P.2 Response to Anticipated Pressurized Thermal Shock Condition | APP-GW-GJP-222 |
| 3. FR-S.1 Response to Nuclear Power Generation – ATWS | APP-GW-GJP-223 |
| 4. FR-S.2 Response to Loss of Core Shutdown | APP-GW-GJP-224 |
| 5. FR-Z.1 Response to High Containment Pressure | APP-GW-GJP-225 |
| 6. FR-Z.2 Response to Containment Flooding | APP-GW-GJP-226 |
| 7. FR-Z.3 Response to High Containment Radiation Level | APP-GW-GJP-227 |
| 8. FR-Z.4 Response to Low Containment Pressure | APP-GW-GJP-228 |
| 9. SDP-4 Response to Increasing Nuclear Flux During Shutdown | APP-GW-GJP-234 |
| 10. SDP-5 Response to Cold Overpressure During Shutdown | APP-GW-GJP-235 |
| 11. SDP-6 Response to Unexpected RCS Temperature Changes During Shutdown | APP-GW-GJP-236 |
| 12. F-0 Critical Safety Function Status Trees | APP-GW-GJP-250 |

APPENDIX B

**LISTS OF DOCUMENTS FOR NORMAL OPERATING PROCEDURES (NOPs) AND
ABNORMAL OPERATING PROCEDURES (AOPs)**

(7 pages including this page)

TABLE B-1

Listing of NOP Documents, Phase 1 to Phase 3 (Preliminary Data)

| Procedure Title | Procedure Number |
|---------------------------------------------------------------------------------------------------------------------------------|------------------|
| <u>Draft Normal Operating Procedures -- Human Factors/ Simulator Development Support (Phase 1)</u> | |
| TOTAL 15 PROCEDURES | |
| 1. Steam Generator Blowdown System | APP-BDS-GJP-101 |
| 2. Component Cooling Water System | APP-CCS-GJP-101 |
| 3. Chemical and Volume Control System | APP-CVS-GJP-101 |
| 4. Feedwater System | APP-FWS-GJP-101 |
| 5. Main Steam System | APP-MSS-GJP-101 |
| 6. Main Turbine System | APP-MTS-GJP-101 |
| 7. Passive Containment Cooling System | APP-PCS-GJP-101 |
| 8. Passive Core Cooling System | APP-PXS-GJP-101 |
| 9. Reactor Coolant System | APP-RCS-GJP-101 |
| 10. Normal Residual Heat Removal System | APP-RNS-GJP-101 |
| 11. Steam Generator System | APP-SGS-GJP-101 |
| 12. Service Water System | APP-SWS-GJP-101 |
| 13. Normal Operation at 100% Power | APP-GW-GJP-101 |
| 14. Plant Shutdown and Cooldown from Mode 1 to Mode 3 | APP-GW-GJP-102 |
| 15. Plant Cooldown from Mode 3 to Cold Shutdown | APP-GW-GJP-103 |
| <u>Draft Normal Operating Procedures plus 1 Surveillance Test -- Operational Task Analysis (OSA-1) Support (Phase 2)</u> | |
| TOTAL 10 PROCEDURES | |
| 1. Plant Cooldown from Mode 5 to Refueling Mode | APP-GW-GJP-104 |
| 2. Plant Heatup - from Refueling Mode to Mode 5 | APP-GW-GJP-105 |
| 3. Plant Heatup – Mode 5 to Mode 4 | APP-GW-GJP-106 |
| 4. Plant Heatup – Mode 4 to Mode 3 | APP-GW-GJP-107 |
| 5. Plant Startup – Mode 3 to 2% Power | APP-GW-GJP-108 |
| 6. Plant Power Escalation from 2% to 100% Power | APP-GW-GJP-109 |
| 7. Secondary Plant Heatup and Startup | APP-GW-GJP-110 |
| 8. Inverse Count Rate Plot Procedure | APP-GW-GJP-111 |
| 9. Critical Rod Position/Boron Concentration Calculation | APP-GW-GJP-112 |

| Procedure Title | Procedure Number |
|----------------------------------------------------------------------------|-------------------------|
| 10. ADS Valve Surveillance Testing During Mode 5 | APP-RCS-GJP-801 |
| <u>Draft Normal Operating Procedures – Remaining NOPs (Phase 3)</u> | |
| TOTAL 20 PROCEDURES | |
| 1. Auxiliary Steam Supply System | APP-ASS-GJP-101 |
| 2. Compressed and Instrument Air Systems | APP-CAS-GJP-101 |
| 3. Condensate System | APP-CDS-GJP-101 |
| 4. Condenser Tube Cleaning System | APP-CES-GJP-101 |
| 5. Turbine Island Chemical Feed System | APP-CFS-GJP-101 |
| 6. Condenser Air Removal System | APP-CMS-GJP-101 |
| 7. Condensate Polishing System | APP-CPS-GJP-101 |
| 8. Circulating Water System | APP-CWS-GJP-101 |
| 9. Diverse Actuation System | APP-DAS-GJP-101 |
| 10. Data Display and Procession System | APP-DDS-GJP-101 |
| 11. Standby Diesel and Auxiliary Boiler Fuel Oil System | APP-DOS-GJP-101 |
| 12. Storm Drains System | APP-DRS-GJP-101 |
| 13. Demineralized Water Treatment System | APP-DTS-GJP-101 |
| 14. Demineralized Water Transfer and Storage System | APP-DWS-GJP-101 |
| 15. Main AC Power System | APP-ECS-GJP-101 |
| 16. Non Class 1E DC and UPS System | APP-EDS-GJP-101 |
| 17. Communication Systems | APP-EFS-GJP-101 |
| 18. Special Process Heat Tracing System | APP-EHS-GJP-101 |
| 19. Plant Lighting System | APP-ELS-GJP-101 |
| 20. Fuel Handling and Refueling System | APP-FHS-GJP-101 |
| 21. Fire Protection System | APP-FPS-GJP-101 |
| 22. Gland Seal System | APP-GSS-GJP-101 |
| 23. Generator Hydrogen and CO2 Systems | APP-HCS-GJP-101 |
| 24. Heater Drain System | APP-HDS-GJP-101 |
| 25. Hydrogen Seal Oil System | APP-HSS-GJP-101 |
| 26. Class 1E DC and UPS System | APP-IDS-GJP-101 |
| 27. Incore Instrumentation System | APP-IIS-GJP-101 |
| 28. Main Turbine and Generator Lube Oil System | APP-LOS-GJP-101 |
| 29. Meteorological and Environmental Monitoring System | APP-MES-GJP-101 |
| 30. Plant Gas Systems | APP-PGS-GJP-101 |

| Procedure Title | Procedure Number |
|--------------------------------------------------------------|-------------------------|
| 31. Plant Control System | APP-PLS-GJP-101 |
| 32. Protection and Safety Monitoring System | APP-PMS-GJP-101 |
| 33. Primary Sampling System | APP-PSS-GJP-101 |
| 34. Potable Water System | APP-PWS-GJP-101 |
| 35. Gravity and Roof Drain Collection System | APP-RDS-GJP-101 |
| 36. Radiation Monitoring System | APP-RMS-GJP-101 |
| 37. Raw Water System | APP-RWS-GJP-101 |
| 38. Reactor System | APP-RXS-GJP-101 |
| 39. Sanitary Drainage System | APP-SDS-GJP-101 |
| 40. Spent Fuel Cooling System | APP-SFS-GJP-101 |
| 41. Seismic Monitoring System | APP-SJS-GJP-101 |
| 42. Special Monitoring System | APP-SMS-GJP-101 |
| 43. Secondary Sampling System | APP-SSS-GJP-101 |
| 44. Turbine Building Closed Cooling Water System | APP-TCS-GJP-101 |
| 45. Turbine Island Vents, Drains and Relief System | APP-TDS-GJP-101 |
| 46. Main Turbine Control and Diagnostics System | APP-TOS-GJP-101 |
| 47. Radiologically Controlled Area Ventilation System | APP-VAS-GJP-101 |
| 48. Nuclear Island Nonradioactive Ventilation System | APP-VBS-GJP-101 |
| 49. Containment Recirculation Cooling System | APP-VCS-GJP-101 |
| 50. Main Control Room Emergency Habitability System | APP-VES-GJP-101 |
| 51. Containment Air Filtration System | APP-VFS-GJP-101 |
| 52. Health Physics and Hot Machine Shop HVAC System | APP-VHS-GJP-101 |
| 53. Containment Hydrogen Control System | APP-VLS-GJP-101 |
| 54. Radwaste Building HVAC System | APP-VRS-GJP-101 |
| 55. Turbine Building Ventilation System | APP-VTS-GJP-101 |
| 56. Central Chilled Water System | APP-VWS-GJP-101 |
| 57. Annex/Aux Building Nonradioactive Ventilation System | APP-VXS-GJP-101 |
| 58. Hot Water Heating System | APP-VYS-GJP-101 |
| 59. Diesel Generator Building Heating and Ventilation System | APP-VZS-GJP-101 |
| 60. Gaseous Radwaste System | APP-WGS-GJP-101 |
| 61. Liquid Radwaste System | APP-WLS-GJP-101 |
| 62. Radioactive Waste Drain System | APP-WRS-GJP-101 |
| 63. Solid Radwaste System | APP-WSS-GJP-101 |
| 64. Waste Water System | APP-WWS-GJP-101 |

| Procedure Title | Procedure Number |
|------------------------------------------------|-------------------------|
| 65. Main Generation System (Generator Portion) | APP-ZAS-GJP-101 |
| 66. Onsite Standby Power System | APP-ZOS-GJP-101 |
| 67. Excitation and Voltage Regulation System | APP-ZVS-GJP-101 |

TABLE B-2

Listing of AOP Documents (Preliminary Data)

| Procedure Title | Procedure Number |
|------------------------------------------------------------------------------------------------------------|-------------------------|
| <u>Draft Abnormal Operating Procedures – Human Factors/ Simulator Development Support (Phase 1)</u> | |
| TOTAL 2 PROCEDURES | |
| 1. Rapid Plant Shutdown | APP-GW-GJP-301 |
| 2. Steam Generator Tube Leak | APP-GW-GJP-304 |
| <u>Draft Abnormal Operating Procedures – Remaining Procedures and Guidelines (Phase 3)</u> | |
| TOTAL 43 PROCEDURES | |
| 1. Emergency Boration | APP-GW-GJP-302 |
| 2. Acts of Nature | APP-GW-GJP-303 |
| 3. Fire Emergency Response | APP-GW-GJP-305 |
| 4. Evacuation of Control Room | APP-GW-GJP-306 |
| 5. Remote Shutdown | APP-GW-GJP-307 |
| 6. Loss of Control Room Air Conditioning | APP-GW-GJP-308 |
| 7. Toxic Gas | APP-GW-GJP-309 |
| 8. Security Events | APP-GW-GJP-310 |
| 9. CEA and Control System Malfunctions | APP-GW-GJP-311 |
| 10. Loss of Flux Indication or Flow Streaming | APP-GW-GJP-312 |
| 11. Uncontrolled Cooldown | APP-GW-GJP-313 |
| 12. Fuel Handling Incident | APP-GW-GJP-314 |
| 13. High Radioactivity | APP-GW-GJP-315 |
| 14. Loss of Containment Integrity | APP-GW-GJP-316 |
| 15. Loss of Component Cooling Water | APP-GW-GJP-317 |
| 16. Condensate System Malfunctions | APP-GW-GJP-318 |
| 17. CVCS Leak | APP-GW-GJP-319 |
| 18. Loss of Circulating Water | APP-GW-GJP-320 |
| 19. Loss of DDS | APP-GW-GJP-321 |
| 20. Generator Malfunctions | APP-GW-GJP-322 |
| 21. Loss of 6.9 kV, 4160 Volt or 480 Volt Bus Power | APP-GW-GJP-323 |
| 22. Loss of the ERF, QSPDS or Security Computer | APP-GW-GJP-324 |

| Procedure Title | Procedure Number |
|-----------------------------------------------------|-------------------------|
| 23. Reset of Engineered Safeguards | APP-GW-GJP-325 |
| 24. Feedwater System Malfunctions | APP-GW-GJP-326 |
| 25. Startup Feedwater System Malfunctions | APP-GW-GJP-327 |
| 26. Feedwater Heater/Extr Steam System Malfunctions | APP-GW-GJP-328 |
| 27. Loss of Instrument Air | APP-GW-GJP-329 |
| 28. Loss of Defense-In-Depth Electrical Power | APP-GW-GJP-330 |
| 29. Loss of Plant DC Power and/or Batteries | APP-GW-GJP-331 |
| 30. Turbine Trip without a Reactor Trip | APP-GW-GJP-332 |
| 31. Turbine Malfunctions | APP-GW-GJP-333 |
| 32. Loss of Turbine Auxiliary Water Cooling | APP-GW-GJP-334 |
| 33. Loss of PLS | APP-GW-GJP-335 |
| 34. Loss of PMS | APP-GW-GJP-336 |
| 35. Passive RHR Heat Exchanger Leak | APP-GW-GJP-337 |
| 36. Passive Cooling System Malfunctions/Alignments | APP-GW-GJP-338 |
| 37. Emergency Fill of Makeup Tanks | APP-GW-GJP-339 |
| 38. Reactor Coolant Leak | APP-GW-GJP-340 |
| 39. Reactor Coolant System High Activity | APP-GW-GJP-341 |
| 40. Reactor Coolant Pump Malfunctions | APP-GW-GJP-342 |
| 41. Loss of Normal Residual Heat Removal | APP-GW-GJP-343 |
| 42. Loss of Spent Fuel Pool Cooling | APP-GW-GJP-344 |
| 43. Loss of Service Water | APP-GW-GJP-345 |