

**CENTER FOR NUCLEAR WASTE  
REGULATORY ANALYSES  
TECHNICAL OPERATING PROCEDURE**

Proc. TOP-001-03

Revision 0

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Title TOP-001-03  
SUBMISSION AND VERIFICATION OF PROGRAM ARCHITECTURE DATABASE ENTRIES

**EFFECTIVITY AND APPROVAL**

Revision 0 of this procedure became effective on 8/26/88. This procedure consists of the pages and changes listed below.

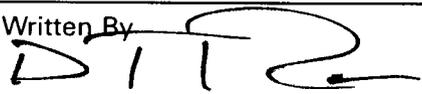
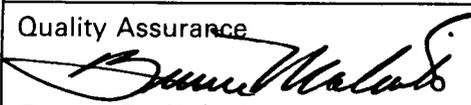
<u>Page No.</u>	<u>Change</u>	<u>Date Effective</u>
1-13	0	8/26/88

**SUPERSEDED**

*By TOP 001, Revision 2,  
Effective 10/17/91*

Supersedes Procedure No. None

**Approvals**

Written By  D. T. Romine	Date <u>8/26/88</u>	Technical Review  Wesley C. Patrick	Date <u>8/26/88</u>
Quality Assurance  Bruce E. Mabrito	Date <u>8/26/88</u>	Cognizant Director  Allen R. Whiting	Date <u>8/26/88</u>

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TOP-001-03

SUBMISSION AND VERIFICATION OF PROGRAM ARCHITECTURE DATABASE ENTRIES

1. PURPOSE AND SCOPE

The purpose of this procedure is to provide instructions concerning the submission and verification of information developed for inclusion in the Program Architecture Relational Database. This is one of a series of procedures prepared by the WSE&I Subelement to provide the necessary controls for development and maintenance of the Program Architecture (PA). This instruction is provided in accordance with the provisions of Technical Operating Procedure (TOP) 001, "Program Architecture Development and Maintenance".

This procedure is intended to ensure consistent and acceptable Program Architecture Database (PADB) content through verification, prior to data entry, that the submitted information satisfies the requirements of TOP-001-02, Program Architecture Relational Database Work Instruction, as completely as possible at a given point in time, and that the information is both correct and clearly written.

Although this procedure provides criteria and instructions applicable to PADB fields 4 through 52, it is not intended that the full scope of this procedure be applied at any one time. Rather, it is intended that the appropriate parts of the Criteria of Section 4 and the Procedure of Section 5 be applied as soon as practicable following development of input information in accordance with Section 6 for each of the 13 key PADB fields and its associated fields. This approach is detailed further in paragraph 5.4.

2. DEFINITIONS

Applicable definitions are provided in Section 2 and Attachment A of TOP-001-02.

3. RESPONSIBILITY

3.1 The WSE&I Subelement Manager is delegated responsibility for PADB verification activities described in this work instruction.

3.2 Other responsibilities are as described in TOP-001, Section 3.

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4. CRITERIA

4.1 Four key criteria dominate the required review and verification process. They represent the four primary attributes desired in the PADB; specifically, that it be (1) complete, (2) correct in content and format, (3) clear in meaning, and (4) concise.

The specific verification criteria are presented in the Attachment to this procedure entitled, "PA Relational Database Verification Criteria". Verification criteria applicable to all input forms and all PADB fields are summarized in the Attachment together with items that require special verification attention. The latter are derived from TOP-001-02, Attachment A.

4.2 Those who perform the review and verification of PADB inputs shall meet two qualification standards: (1) They shall possess the capability in terms of training and experience to have conducted, or to have effectively contributed to the conduct of, the analyses whose results they are reviewing, and (2) they shall not have participated in the conduct of those particular analyses that are the subject of the review.

5. PROCEDURE

5.1 The review and verification of PADB inputs shall be conducted in accordance with the requirements of TOP-001, Sections 4.A.4.3 through 4.A.4.8; TOP-001-02, Sections 5.2, 5.3 and 5.5; and the body of this procedure to ensure that the content of the PADB satisfies the requirements of TOP-001-02, Sections 5.4 and 6.1, and Attachment A; and the Attachment to this procedure.

5.2 One or more Program Architecture Review Committees (PARC) shall be formed in accordance with the provisions of TOP-001 to review and verify submitted PADB inputs prior to their entry into the Database.

5.3 The WSE&I Subelement Manager will oversee the activities of the PARCs in implementing this procedure. The NRC CNWRA Program Manager may assign one or more members of his staff to observe the proceedings of the PARCs from time-to-time. He will be advised of the PARC schedule by the WSE&I Subelement Manager.

5.4 As indicated in Section 1, it is intended that verification occur as soon as practicable following development of input information for each of the 13 key PADB fields and its associated fields. These fields are:

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<u>Key Field</u>	<u>Subject</u>	<u>Associated Fields</u>
9	Regulatory Requirement	4 to 8, 10 to 13
15	Elements of Proof	14, 16 to 19
21	Evaluation Findings	20
25	DOE Compliance Demonstration Method	24 and 26
28	NRC Compliance Determination Method	27
30	Uncertainties	29, 31 to 34
35	NRC Uncertainty Questions	---
37	DOE Uncertainty Reduction Methods	36
39	NRC Uncertainty Reduction Methods	38 and 40
42	Information Requirements	41, 43 to 45
46	Priority/Ranking	---
47	Costs, Schedules and Networks	---
49	Open Items	48, 50, 51

NOTE: Fields 22, 23 and 52 are database management/status fields not pertinent to the above subjects. Their content is to be verified nonetheless.

Certain pairs of these key fields are sufficiently closely related to require a refamiliarization effort if, after development of the information for the first key field and its associated fields, there is a pause for verification before developing information for the second key and associated fields. Thus, in order to maximize the effectiveness of limited personnel resources, the WSE&I Subelement Manager may elect to complete the development of not more than two related key fields and their associated fields before submitting the resulting information for verification per this procedure. The principal examples of such closely related key fields are Fields 28 and 42, Fields 30 and 35, and Fields 39 and 42. The WSE&I Subelement Manager shall obtain the written concurrence of the Director of SE&I and the Technical Director before undertaking the above action.

5.5 In order to fully understand the reasoning behind the submitted information, the PARC shall work closely with the Element/Subelement Manager, associated staff and/or consultants who developed the submitted information. The PARC shall also make full use of the records and notes of the developers to understand the decisions behind the submitted inputs. This will ensure that other factors (beyond the identified criteria) that may have influenced the selection of proposed PADB content are properly considered. Where identified, such additional factors shall be documented as provided for in Section 7 of this procedure.

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5.6 The PARC shall not in any way revise or modify the submitted PADB input information. The responsibility of the PARC is to (1) identify specific instances where the input fails to fully satisfy the requirements identified in Section 5.1, (2) provide the rationale for that PARC position where it may not be self-evident, and (3) recommend specific corrective action.

In this vein, the PARC is to question or recommend the inclusion or omission of specific material; request or recommend abbreviation, expansion, clarification or wholesale revision of specific inputs or parts thereof; question the technical accuracy or adequacy of the input; recommend alternative strategies or approaches; identify unnecessary duplication of material within or among fields; point out problems in the organization of material; identify any other specific deficiencies in accuracy, consistency, completeness, or clarity; and recommend appropriate corrective action.

The responsibility for corrective action shall remain with the developer(s) of the input who are represented by the Center Element or Subelement Manager responsible for preparation of the respective input(s). Only in this way can the PARC preserve the reviewer independence required by paragraph 4.2.

5.7 Consistent with the preceding, the submission and verification of PADB input information shall proceed as follows:

- 1) PADB information developed by teams designated by the Director of SE&I and approved by the Technical Director shall be submitted using the appropriate IBM Display Write 4 (DW4) input form template(s) (see paragraph 6.1) by the Center Element or Subelement Manager designated to be the team leader. The completed input form template(s) shall be submitted on diskette in accordance with Section 6 to the Chairman of the designated PARC.
- 2) The PARC Chairman shall cause hard copy to be produced from the diskette and distributed to all members of the PARC. An additional copy shall be retained for file.
- 3) The PARC members shall review the submitted information in accordance with paragraphs 5.1, 5.5 and 5.6. All comments shall be legibly written on the hard copy in black ink or, where space does not allow, on attached sheets with clear identification of the subject field, paragraph, line, etc. Comments and recommended actions shall be as brief and specific as practicable.

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General reactions or observations are not acceptable and require no action on the part of the information originator. The attached comment sheets and the individual comments on the hard copy shall be dated and signed (or initialed) by the individual originating reviewer(s) or by the PARC Chairman acting for a group of reviewers.

- 4) The PARC members shall reproduce their review packages and provide the originals and one copy each to the PARC Chairman, who shall collect and provide a complete set of original review packages to the responsible Element/Subelement Manager.
- 5) The Element/Subelement Manager or his designee shall review each comment and mark it (in black ink) either "Accept" or "Reject". If the disposition is "Reject", the reason shall be legibly summarized on the original review package. These preliminary dispositions shall then be coordinated with the respective reviewers to reach common understandings of the perceived deficiencies, agree on final dispositions, and develop approaches to remedial action acceptable to both originator and reviewer. If agreement cannot be reached on these points, the question(s) shall be taken to the Director of SE&I for resolution.
- 6) For each comment dispositioned "Accept", an appropriate revision of the submitted information shall be drafted by the Element/Subelement Manager or his designee. If space permits, the revision shall be written in black ink on the review original. Otherwise, it shall be drafted as part of a revised copy of the complete original DW4 file with appropriate change to the filename extension (see paragraph 6.2). In the revised DW4 file, "overstrike" (F4, 8) shall be used to indicate text to be deleted and "mark" (F4, 9) shall be used to highlight new text. THE ORIGINAL COMPUTER FILE OF SUBMITTED INFORMATION SHALL NOT BE ALTERED.
- 7) The responsible Element/Subelement Manager or his designee shall coordinate the draft revisions with each cognizant reviewer. When a revision is mutually acceptable, the reviewer shall sign (or initial) and date a hard copy of the revision and obtain a copy for his file. When all revisions have been accepted, the Element/Subelement Manager shall cause all revisions to be merged into a complete NEW DW4 input form template file with highlighting removed and overstruck text deleted. The Manager shall provide this new file (on diskette with the correct

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extension revision number) together with a complete hard-copy file of review package originals and signed-off revisions to the PARC Chairman.

- 8) The PARC Chairman or his designee shall review the hard-copy file to ensure that all comments have been properly responded to and that the necessary signatures (or initials) and dates are in place. As a part of this review, he shall cause the content of the above hard-copy file to be compared with the content of the revised DW4 input information file to ensure that the new DW4 file is complete and properly merged. He shall also confirm that the DW4 filename and extension revision number are correct.
- 9) When the PARC Chairman is satisfied that all comments have been properly dispositioned and that the revised submittal is complete, he shall (1) enter in the DW4 file the PARC information called for by the template (see paragraph 6.1), (2) mark the diskette label "Accepted", (3) sign (or initial) and date the label, and (4) submit the diskette to the Director of Information Management Systems for incorporation of the file in the PADB. At that point, the information shall come under change control. The PARC Chairman shall provide the complete hard-copy file to the Director of Quality Assurance for permanent retention in the Center archives.

5.8 In the course of developing Regulatory Requirements, the development team shall prepare a checklist to ensure that all Regulatory Texts contained or referenced in the assigned regulation(s)\statute(s) are incorporated in at least one Regulatory Requirement. The completed checklist shall be included in the associated permanent hard-copy file provided to the PARC Chairman.

5.9 The WSE&I Subelement Manager and the Technical Director, with the assistance of the Director of Quality Assurance, shall conduct periodic checks of PARC verification activities against the criteria of this procedure. Each such check shall be documented using hardcopy, electronic media, or a combination of these. If the verification is judged adequate, the PARC activity will continue. In the event that the verification action or process is judged to be inadequate, further instruction, training, and/or examples shall be provided for use in correcting the verifications that have already been completed and to ensure that further verifications are adequate. A second cycle of checking shall be conducted covering corrected verifications and new verifications of the same type.

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5.10 If in the course of verifying submitted PADB inputs the PARC becomes aware that additional criteria or instructions, or modification to existing criteria or instructions for PADB input submission or verification are needed, the PARC shall immediately petition the WSE&I Subelement Manager concerning the suggested changes. Approval of changes to be incorporated shall be at the same level as approval of this work instruction. Upon approval, the following action shall be taken:

- 1) This work instruction shall be "red lined" and initialed to indicate the changes,
- 2) It shall be distributed to all affected parties with instructions for implementing the changes for all new work,
- 3) The Director of SE&I and the Technical Director (with advice from the WSE&I Subelement Manager) shall determine (a) whether the change requires reprocessing of items already verified using the predecessor procedure, and if so, (b) the type and scope of reprocessing required, and (c) whether additional work instructions are required for the reprocessing.
- 4) As necessary, additional work instructions shall be prepared and reprocessing completed.

5.11 If in the process of verifying PADB inputs the PARC becomes aware of the need for additions or modifications to the PADB criteria or instructions contained in TOP-001-02, the PARC shall immediately notify the WSE&I Subelement Manager in accordance with paragraph 5.7 of that procedure.

6. **FORMAT AND CONTENT GUIDE FOR INPUTS**

6.1 PADB input form templates shall be prepared using the DW4 word processing program. These templates shall contain the definitions and content instructions of TOP-001-02, Attachment A. Each input form shall also contain provision for the complete alphanumeric identifier for the PADB input, the name of the responsible Center Element/Subelement Manager, the date of submission to the PARC, the name of the PARC Chairman, PARC review status and date, QA review status and date, and related information. ALL INFORMATION ORIGINATED FOR THE PURPOSE OF INCLUSION IN THE PADB SHALL BE PREPARED USING THESE TEMPLATES AND SHALL BE SUBMITTED ON DISKETTES.

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Partial or incomplete input forms shall not be accepted for review. Special exceptions to this policy require the prior approval of the WSE&I Subelement Manager.

6.2 Prior to the initial submission of a template, the responsible Manager shall assign a filename and extension in MS-DOS format. The filename shall be the initials of the responsible Manager followed by a number assigned by him that uniquely identifies the file. That number shall correspond to the order in which he has been assigned responsibility for original PADB inputs. The number shall be preceded by zeros to fill out the eight characters allowed in a filename by MS-DOS. For example, the template for the first input for which manager XYZ is responsible shall have "XYZ00001" as its filename, the template for the twelfth input assigned to him shall have the filename "XYZ00012", etc. ONCE SUBMITTED, THE FILENAME FOR A GIVEN INPUT SHALL NOT BE CHANGED.

The extension on the filename shall be the revision number for that input file using all three characters allowed by MS-DOS. The filename extension for the original submittal of a given input to the PARC shall be ".R00" (Revision 0). Subsequent revisions of that input submitted to the PARC shall carry the extension ".R01", ".R02", etc.

Thus, the complete filename for the first revision of the twelfth input assigned to manager XYZ would be "XYZ00012.R01".

6.3 Should the need for changes be identified in the process of verification covered by this instruction, this need shall be brought to the attention of the WSE&I Subelement Manager for disposition in accordance with paragraph 5.10.

**7. RECORDS**

Records shall be developed and maintained in accordance with Sections 4.A.4.3 through 4.A.4.6, and 4.A.4.8 of TOP-001. The "red-lined" procedures; original PADB input submissions; notes of key factors, criteria and rationale that influenced the content of the input submissions; and records of review comments and modifications to the PADB inputs described in Section 5 of this procedure shall be developed as indicated and maintained in the Center files. Appropriate records shall be maintained of Quality Assurance surveillances, reviews and/or audits performed.

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8. QUALITY ASSURANCE

A Quality Assurance program shall be implemented for this procedure in accordance with the provisions of Sections 4.A.4.7 and 4.A.4.8 of TOP-001. Either electronic or hardcopy objective evidence is acceptable for independent verification of the acceptability of review and verification activities performed in accordance with this procedure.

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Attachment to TOP-001-03

PA Relational Database Verification Criteria

**NOTE: THIS ATTACHMENT IS INTENDED TO SERVE ONLY AS A CHECKLIST. AS SUCH, IT CONTAINS HIGHLY ABBREVIATED DESCRIPTIONS OF THE REQUIRED CONTENTS OF THE PADB FIELDS. FOR COMPLETE DESCRIPTIONS, SEE THE REFERENCED FIELD CONTENT DESCRIPTIONS IN TOP-001-02, ATTACHMENT A.**

**ALL INPUT FORMS**

Analyst's name is complete.  
Submission date is complete and correct (content and format).  
Identification Number is complete and correct (content and format).

**ALL FIELDS**

Input terminology and development are correct per the Definitions.  
Input is complete and correct per the Content instructions of TOP-001-02 and the input form templates.  
Input is technically correct.  
Input is clear (organized, understandable, unequivocal).  
Input is concise (succinct, specific, nonredundant).

**SPECIAL VERIFICATION ATTENTION**

Regulatory Requirement Topic (See TOP-001-02, Att. A, Field 8)

- a) The subject and all keywords that would reasonably be the object of a search of Field 9 are identified.
- b) All keywords identified receive meaningful treatment in the text of Field 9.
- c) Terms are those PADB users are most likely to have in mind when undertaking a search of Field 8.
- d) Subject and keywords are brief and specific (preferably three words or less).
- e) Delimiters are correct (comma, comma, space).

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Regulatory Requirement (See TOP-001-02, Att. A, Field 9)

- a) Regulatory Text numbers are correct.
- b) Included Regulatory Text are all applicable.
- c) All applicable Regulatory Text are included.
- d) Regulatory Text that details, explains or qualifies the primary requirement or treats the means of demonstrating compliance is included.
- e) Guidance regarding application for exceptions, procedural guidance, and definitions are **NOT** included.

Regulatory Requirement Notes

- f) If Institutional Uncertainties relative to the parent regulation/statute are defined in Field 30, that fact is noted in the Regulatory Requirement Notes field.
- g) If Regulatory Uncertainties in the Regulatory Text are defined in Field 30, that fact is noted in the Regulatory Requirement Notes field.
- h) The bases for decisions made in developing the Regulatory Requirement are described in the Regulatory Requirement Notes field.

Related Regulations (See TOP-001-02, Att. A, Field 12)

- a) Regulatory Texts from agencies other than the NRC that are applicable to NWSA high-level waste are listed.
- b) Analogous NRC Regulatory Texts that are **NOT** directly applicable to NWSA high-level waste are listed.

Element of Proof Topic (See TOP-001-02, Att. A, Field 14)

- a) The subject and all keywords that would reasonably be the object of a search of Field 15 are identified.
- b) All keywords identified receive meaningful treatment in the text of Field 15.
- c) Terms are those PADB users are most likely to have in mind when undertaking a search of Field 14.
- d) Subject and keywords are brief and specific (preferably three words or less).
- e) Delimiters are correct (comma, comma, space).

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Elements of Proof (EOP) (See TOP-001-02, Att. A, Field 15)

- a) All EOP are embodied in the parent Regulatory Requirement.
- b) Postulated EOP made necessary by a Regulatory Uncertainty are NOT included in this field (See Field 39).
- c) Where a Technical Uncertainty exists (i.e., the regulation is clear and complete, but the inherent technical approach is considered inappropriate), the EOP is included here and the uncertainty is defined in Field 30.
- d) EOPs include standards by which evidence will be compared.
- e) EOPs succinctly define WHAT must be proven. (Fields 25 and 28 define HOW.)
- f) EOPs are taken from the lowest levels of the EOP Hierarchy.
- g) EOPs are included for demonstration method validity and data acceptability.
- h) The EOP Hierarchy and EOP text cite the parent Regulatory Requirement.
- i) Each block of the EOP Hierarchy (graphic and text) identifies the principal and associated Regulatory Text.
- j) EOPs include appropriate probability and/or confidence statements.
- k) Each EOP is accompanied by general guidelines and criteria for acceptable DOE Compliance Demonstration Method(s).

Element of Proof Notes

- l) Regulatory and/or Technical Uncertainties defined in Field 30 relative to EOPs are referenced in the EOP Notes field.
- m) The bases for decisions made in developing each EOP are described in the EOP Notes field.

[Development of this Attachment is continuing.]

# Center for Nuclear Waste Regulatory Analyses

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August 26, 1988

Philip M. Altomare  
U. S. Nuclear Regulatory Commission  
Division of High Level Waste Management  
WF1  
Mail Stop 4-H-3  
Washington, DC 20555

Subject: Completion of Milestones P4 and D9

Dear Mr. Altomare:

This letter transmits a Technical Operating Procedure in fulfillment of the subject Center milestones (defined in the letter from J. Latz to M. Mace, July 26, 1988). These Center intermediate milestones are:

- P4 Prepare draft guidelines and specifications for the PARC to review data input for Process Diagram Blocks 3 through 22.
- D9 Finalize PARC guidance for review of Element data input for Process Diagram Blocks 3 through 15.

These Milestones are fulfilled by the attached procedure TOP-001-03 "Submission and Verification of Program Architecture Database Entries". Consistent with TOP-001-02, the procedure has been extended to include Process Diagram Blocks 2 through 22.

This procedure has been promulgated in final form to expedite Program Architecture development activities. Like most such procedures for prototype activities, it is anticipated that the procedure will be refined with use, in accordance with the provisions of TOP-001 "Program Architecture Development and Maintenance". Any comments and suggestions generated by the NRC staff can be incorporated at the time of such revisions. Note also that the WSE&I Subelement will develop and promulgate additional guidance in the form of examples and/or will provide training, if it becomes necessary.

Please contact me if you have any questions regarding this matter.

Sincerely yours,

  
Allen R. Whiting  
Director SE&I

cc: J. Bunting - 4  
M. Mace - 1  
J. Latz  
Center staff



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**EFFECTIVITY AND APPROVAL**

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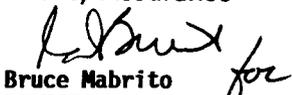
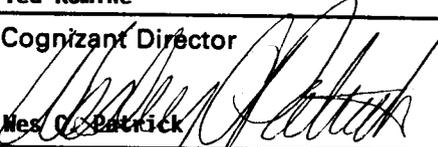
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1-13	0	8/26/88

THIS PROCEDURE IS SUPERSEDED BY TOP-001, REVISION 2, EFFECTIVE

**SUPERSEDED**

Supersedes Procedure No. None

**Approvals**

Written By  Patrick C. Mackin	Date 10/8/91	Technical Review  Ted Romine	Date 10/8/91
Quality Assurance  Bruce Mabrito	Date 10/11/91	Cognizant Director  Max G. Patrick	Date 10/11/91