



# TENNESSEE VALLEY AUTHORITY

Division of Construction



## WATTS BAR NUCLEAR PLANT

### QUALITY CONTROL INSTRUCTION

# QCI-1.25

**TITLE:** CONTROL OF AS-CONSTRUCTED DRAWINGS

	REVISION 0	R6	R7	R8	R9	R10
	DATE 8/5/80	9/2/83				
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## 1.0 PURPOSE

- 1.1 This instruction defines the interfaces and responsibilities of the Division of Construction (CONST) as it relates to the control of as-constructed drawings.

## 2.0 SCOPE

- 2.1 This instruction applies to the control of drawings of features, components, or systems within the scope of the WBNP Quality Assurance Program.

## 3.0 REFERENCES

- 3.1 ID-QAP 6.1, "Configuration Control"

## 4.0 DEFINITIONS

- 4.1 As-Constructed Drawings—Drawings which depict the as-built configuration of a component, system, or structure at a point in time as indicated by date of issue as shown in revision block.
- 4.2 Configuration Control—The system whereby all drawings are "as-constructed" prior to tentative transfer.
- 4.3 Drawing Control Center (DCC)—CONST-NUC PR joint staffed group responsible for handling configuration control. This group is responsible for all transferred systems and equipment. This group operates under the direction of the CONST Document Control Unit supervisor.
- 4.4 Drawing Information System (DIS)—A computerized system utilizing an immediately accessible data base which tracks the status of TVA and vendor drawings, tracks the status of ECNs, and assists in documenting the drawing as-constructed status and fuel loading certifications.
- 4.5 Reproducible—Drawings of which the original is transparent or translucent and is capable of being reproduced in full or reduced size, being microfilmed, and being revised.
- 4.6 System Configuration Control Drawing List (SCCDL)—A list by systems of Configuration Control Drawings compiled by NUC PR as the minimum needed for operation and maintenance of the plant between tentative transfer and fuel loading.

5.2.4 Informs DCC of Test Record Drawings required for Pre-Op Test in advance of the transfer date to allow DCC time to order the drawings.

5.3 The Responsible Engineering Unit (REU):

5.3.1 Marks transfer boundaries on non-SCCDL drawings and SCCDL drawings not covered by 5.2.2.

5.3.2 Drafts actual system configuration on all drawings being as-constructed. For hangers the annotation of the Field Change Request (FCR) allowing deviation in configuration is acceptable.

5.3.3 Certifies the as-constructed status of a drawing.

5.3.4 Forwards the original weld maps and instrumentation sketches to DCC.

5.4 Hanger Engineering Units (HEUs)

5.4.1 In addition to the responsibilities listed in section 5.3, the HEUs "as-construct" hanger sketches and forward reproducible as-constructed copies to DCC.

5.5. N-5 Unit

5.5.1 Affixes an N-5 decal to each drawing that contains ASME Code items.

6.0 PROCEDURE

6.1 System Configuration Control Drawing List (SCCDL)

6.1.1 The STCU:

6.1.1.1 Reviews all NUC PR-generated SCCDLs and SCCDL revisions.

6.1.1.2 Initiates a memorandum from the CONST Project Manager to the NUC PR Plant Manager indicating review of and any comments on each SCCDL.

6.1.2 The DCC:

6.1.2.1 Retains a copy of all approved latest revision SCCDLs once received from NUC PR.

6.1.2.2 Initiates a memorandum from the CONST Project Manager to the NUC PR Plant Manager indicating review of and any comments on each SCCDL.

6.2 Handling of Reproducibles and Drawing Distribution

6.2.1 For TVA and Vendor drawings the DCC:

6.2.1.1 Tracks the status of all applicable drawings from the time these reproducibles are first ordered from EN DES until they are transmitted to NUC PR prior to fuel loading.

6.2.1.2 Orders required reproducibles from EN DES by memorandum from the CONST Project Manager to the Design Project Manager.

6.2.1.2.1 Lists the drawing number and indicates whether the drawing is for a Configuration Control (CC) drawing or an as-constructed drawing (Non-SCCDL).

6.2.1.2.2 Requests that the indicated sticker be attached.

6.2.1.2.3 Orders these reproducibles sufficiently in advance of completed work packages, scheduled system or subsystem tentative transfer date to allow EN DES time to furnish the reproducibles.

6.2.1.3 If TVA or vendor drawing reproducibles are not available from EN DES at completion of a work package or at tentative transfer, uses the best available print and affixes a decal as shown below near the title block.

For SCCDL drawings:

**THIS DRAWING  
IS UNDER  
CONFIGURATION CONTROL**

For non-SCCDL drawings:



6.2.2 For hanger sketches the DCC:

6.2.2.1 Obtains a reproducible of each "as-constructed" sketch from the Hanger Engineering Unit.

6.2.2.2 Tracks the status of all sketches from the time these reproducibles are obtained.

6.2.3 For Weld maps and Instrumentation sketches the DCC:

6.2.3.1 Obtains the original sketches from the REU.

6.2.3.2 Tracks the status of all sketches from the time these sketches are obtained.

6.2.4 For all drawings the DCC:

6.2.4.1 Transmits the required number of each certified drawing on the SCCDL to NUC PR whenever there is a drawing change. For example: work package, transfer, workplan, and general update.

6.2.4.2 Maintains one set of "as-constructed" SCCDL drawings filed by drawing number.

6.2.4.3 Transmits copies of each certified "as-constructed" reproducible not on the SCCDL to NUC PR upon request. No CONST distribution of these drawings is made.

6.2.4.4 Prior to fuel loading, submits all "AC" status reproducibles to EN DES for review, approval, and microfilming using a memorandum from the CONST Project Manager to the Design Project Manager stating the reproducibles have been as-constructed and are ready for approval and microfilming.

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6.2.4.5 Transmits a copy of each "as-constructed" drawing with an N-5 decal to N-5 for review each time the drawing is as-constructed. These drawings are stamped Information Only.

6.3 Certification of As-Constructed Drawings

6.3.1 At the completion of a work package, at the beginning of a transfer, or upon request from the responsible engineering units, the DCU (HEU for hanger sketches):

6.3.1.1 Pulls the reproducible from the files (if reproducible are not available, obtain good paper copies).

6.3.1.2 Removes or cross hatch out the EN DES revision block.

6.3.1.3 Affixes the "as-constructed" revision block shown below.

issued to depict as-constr. config. EN DES Rev. \_\_\_\_\_

REV	UNIT	SYS	TRANS	ECN/FCR	SUBM	RECM	APPR	DATE	DIST	DATE
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Individual responsible for as-constructed configuration

Cognizant Engineer

CONST PM or designee

Dist Date

EN DES PM

Date CONST PM signs prior to forwarding to EN DES

6.3.1.4 Fills in the CONST revision, unit, system, or system transfer, ECN/FCR.

6.3.1.5 Signs the submittal on the "as-constructed" revision block.

6.3.1.6 Affixes the "as-constructed" sticker shown below (any time any part of the drawing is first certified).

**AS CONSTRUCTED**

6.3.2 The ST&CU marks the transfer boundaries on the SCCDL drawings (flow and control drawings only).

- 6.3.4.1.5 Not installed or not operational features within transferred boundaries are encircled with solid lines and so indicated by an outstanding work item number.
- 6.3.4.2 Describe each CONST drawing revision by a separate filled out and signed revision block. All incomplete work noted on drawings at the time of tentative transfer has the outstanding work item number noted.
- 6.3.4.3 CONST revisions start with the letter "A." The CONST revisions are sequentially lettered. The letters "I," "O," and "Q," are not used.
- 6.3.4.3.1 After the letter "Z" is used, the construction revisions are sequentially lettered with double letters ("AA," "BB," "CC" through "ZZ"), then triple letters ("AAA," "BBB," "CCC" through "ZZZ"), then quadruple letters, etc. The letters "II," "OO," "QQ," "III," etc., are not used.
- 6.3.4.5 Notifies the N-5 Unit whenever a drawing that contains ASME code items is as-constructed and does not have an N-5 decal affixed to the drawing.
- 6.3.5 It is permissible for the REU to update CONST revisions for minor drafting additions or corrections which were correct at time of transfer, completed work package, or drawing reissue. This type of reissue has the next higher "as-constructed" revision level.

NOTE: This does not apply to sketches.

- 6.3.6 The REU:

NOTE: For Sketches, only the status AC or AD is used.

- 6.3.6.1 Statuses the drawing on the "as-constructed" title block using the following status codes:
- 6.3.6.1.1 NA--Not Applicable (CONST input)
- 6.3.6.1.2 AC--As-constructed (CONST or NUC PR input) built as designed with approved changes and or incomplete work.
- 6.3.6.1.3 AD--As-Designed (CONST or NUC PR input) built as designed with no changes.
- 6.3.6.1.4 PC--Partial as-constructed (Construction's input-work currently in progress--status has to change to AD or AC prior to fuel loading).

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- 6.3.6.1.5 IC--As-constructed with temporary interface between units, installed to allow operation of one unit while the other is under construction (CONST input).
- 6.3.6.1.6 FC--Future Construction (Construction Input-Complete revision approved by EN DES for delaying construction implementation until after fuel loading).
- 6.3.6.1.7 1--Used as a suffix in conjunction with above-listed codes to indicate all drawing requirements necessary for unit 1 operation. This may include items common to other units.
- 6.3.6.1.8 2--Used as a suffix in conjunction with above-listed codes to indicate all drawing requirements necessary for unit 2 operation.
- Example: AC1AC2 - As-constructed--Built as designed with changes, units 1 and 2
- AD1PC2 - As-designed--Built as designed unit 1, partial as constructed unit 2
- 6.3.6.1.9 AD1NA2 - Construction is complete with no changes on a drawing for unit 1.
- 6.3.6.1.10 NA1AD2 - Construction is complete with no changes on a drawing for unit 2.
- 6.3.6.1.11 AD1 - Construction for unit 1 is complete with no changes on a drawing used for units 1 and 2.
- 6.3.6.1.12 PC1PC2 - Drawing is partial "as-constructed" for both unit 1 and unit 2.
- 6.3.6.1.13 AC1PC2 - Drawing is built as designed with approved changes for unit 1 and partial "as-constructed" for unit 2.
- 6.3.6.1.14 AD1AD2 - Construction is complete with no changes for both units 1 and 2.
- 6.3.6.2 Signs or initials the "as-constructed" revision block to verify the "as-constructed" configuration for each work package, transfer, or CONST revision.
- 6.3.6.3 Verifies that all previous construction revisions have been properly transferred to the new EN DES or REU revision and that all previous construction revisions were properly approved.

6.3.6.3.1 Does not carry previously certified CONST revision blocks over to higher EN DES or REU revision level reproducibles when they are certified.

6.3.6.3.2 Indicates as a single transfer boundary on the higher EN DES revision level all previous transfer boundary condition indicated on past certified CONST revision whether singular or multiple.

Example: EN DES revision R5 contained three past transfers (A, B, and C). EN DES revision R6 combines these into one single boundary area on construction revision D. Any indicated temporary conditions, OWIN areas, interface, etc., are carried over and so indicated on the new EN DES revision until completion of these outstanding items.

6.3.6.3.3 Indicates as a single transfer boundary on the higher REU revision level all previous transfer boundary conditions indicated on past certified CONST revision whether singular or multiple.

NOTE: For hanger sketches, weld maps, and instrumentation sketches, the construction revisions start over with the letter "A" when the REU revision number changes.

Example: REU revision R-3 contained three (3) past transfers (A, B, and C). REU revision R-4 combines these into one single boundary area on construction revision A. Any indicated temporary conditions, CWIN areas, interface, etc., are carried over and so indicated on the new REU revision until completion of these outstanding items.

6.3.7 The REU Supervisor or ST&C Unit supervisor signs or initials and dates the as-constructed revision block to indicate that the CONST revision is correct and ready for printing and issue.

6.3.8 The N-5 Unit affixes an N-5 decal to each drawing that contains ASME Code items.

#### 6.4 Maintaining As-Constructed Drawings

6.4.1 The REU updates each required drawing as the modifications are completed and gives the updated drawings the next higher CONST revision letter.

6.4.2 The DCC makes distribution on all such updates, if required.

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6.4.3 The REU:

6.4.3.1 Shows work package boundaries on updated revisions until the area is transferred.

6.4.3.2 When updating SCCDL drawings, transfer boundaries are always shown. When updating non-SCCDL drawings, transfer boundaries are shown only on partially as-constructed drawings.

-6.4.3.3 Ensures that no workplan boundaries are shown on updated revisions.

6.5 Drawing Information System (DIS)

6.5.1 The REU notifies the DCC of any drawings listed on the DIS which were not used in constructing the plant.

6.5.2 The DCC:

6.5.2.1 Marks in the DIS the "as-constructed" status of all drawings which have been certified.

6.5.2.2 Marks NA in the DIS for all drawings which the REU notifies were not used in constructing the plants.

7.0 DOCUMENTATION

7.1 One up-to-date full-size copy of the DIS is transmitted to NUC PR prior to licensing. This program shows the correct as-constructed codes and revision levels as reviewed and approved by EN DES.

8.0 ATTACHMENT

8.1 None

CONTROL OF AS-CONSTRUCTED DRAWINGS		WBNP-QCI-1.25	REVISION LOG
Title:			
Revision No.	DESCRIPTION OF REVISION	Date Approved	
1	General revision	10-20-80	
2	Procedure rewritten	05-18-81	
3	To comply with format prescribed in WBNP-QCI-1.10 R5. To incorporate Addendum 1. Deleted all attachments and the section on verification of configuration for fuel loading.	04-19-82	
4	To allow HEU to only mark FCR Nos and not have to draw in the change; to define temporary conditions in section 6.3.4.1.2; to exempt hanger "A" size drawings from being encircled by dashed lines; to state that it is not required to as-construct drawing upon completion of work packages; to state that DCC keeps a file of non-SCCDLS; to state additional DCC and ST&CU responsibilities changed number of copies sent to NUC PR; changed requirements on marking drawings.	09-10-82	
5	To clarify the markup of transfer boundaries on SCCDL drawings by having the REUs mark transfer boundaries on SCCDL drawings excluding flow and control drawings. Added ST&C unit supervisor option to final drawing certification.	01-05-83	
6	To resolve audit JA-8300-01. Explained how hanger sketches, weld maps, and instrumentation sketches are as-constructed. Added the responsibilities of the N-5 Unit. Added reference 3.1.	09-02-83	

4.7 Drawings—As used in this instruction the word "drawing" includes TVA and vendor drawings, hanger sketches, weld maps, and instrumentation sketches. Unless stated otherwise, hanger sketches, weld maps, and instrumentation sketches are handled the same as TVA and vendor drawings. Sketches and site drawings used for fabrication, erection, or installation may be excluded when specifically approved by the design engineer.

## 5.0 RESPONSIBILITIES

### 5.1 Drawing Control Center(DCC)

5.1.1 Maintains a file of the latest revision SCCDLs and non-SCCDLs.

5.1.2 Requests from ES DES, receives, and stores reproducible.

5.1.3 Prepares drawings (all except hanger sketches) to be "as-constructed."

5.1.4 Controls and distributes "as-constructed" drawings to NUC PR.

5.1.5 Maintains "as-constructed" drawing status on the DIS.

5.1.6 Transfers "as-constructed" drawings to NUC PR prior to fuel loading.

5.1.7 Reviews and comments on NUC-PR SCCDLs.

5.1.8 Processes all DIS updates.

5.1.9 Trains NUC PR employees in the operation of the DCC.

5.1.10 Obtains "as-constructed" hanger sketches from the Hanger Engineering Units (HEU).

5.1.11 Obtains the original weld maps and instrumentation sketches from the Responsible Engineering Units.

### 5.2 The Startup Testing and Coordinating Unit (ST&CU)

5.2.1 Reviews and comments on SCCDLs and all revisions.

5.2.2 Marks transfer boundaries on SCCDL drawings (flow and control drawings only).

5.2.3 Informs DCC of the drawings required for a transfer in advance of the transfer date to allow DCC time to order the drawings.

**6.3.3 The REU:**

6.3.3.1 In preparation for a tentative transfer, marks the transfer boundaries on the non-SCCDL drawings if the whole drawings cannot be "as-constructed" and marks transfer boundaries on SCCDL drawings not covered by 6.3.2.

6.3.3.2 If desired, upon completion of a work package, marks the drawings to show the area "as-constructed."

6.3.3.3 If possible, "as-constructs" the entire drawing.

6.3.3.4 Drafts on both SCCDL and non-SCCDL drawings any temporary conditions, minor corrections, unincorporated FCRs, incomplete work, or temporary interfaces (if paper copies are used the reproducibles are handled the same as above once received by the DCC).

6.3.3.4.1 It is permissible for REU to record unincorporated FCR numbers on the drawings being as-constructed in lieu of drafting the changes caused by the FCRs.

**6.3.4 The ST&CU and REUs:**

6.3.4.1 Utilize the drafting guidelines identified below for marking reproducibles:

6.3.4.1.1 Transferred boundaries are encircled by dashed lines with the construction revision level inside the area. The "as-constructed" revision level is indicated with an arrow from it to the dashed lines which encircle the transferred boundary.

6.3.4.1.1.1 Hanger "A" size drawings do not require dashed line encirclement.

6.3.4.1.2 Temporary conditions (items that result in drawing revisions or craft work) or workplan boundaries within the transferred boundaries are encircled with solid lines with the associated message such as temporary or workplan number.

6.3.4.1.3 Work packages are included in solid lines with the associated work package number.

6.3.4.1.4 EN DES-approved but not incorporated and CONST-installed FCRs within the transferred boundaries are encircled in solid lines with associated FCR number.