



CAW-5026

Westinghouse  
Electric Corporation

Water Reactor  
Divisions

Nuclear Commercial  
Operations Division

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November 29, 1982

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COMMONWEALTH EDISON COMPANY  
BYRON STATION - UNIT 1  
Rev. 3, Piping Interface Control Agreement

Dear Mr. Deress:

Enclosed for your use is a copy of the approved Interface Control Agreement Westinghouse Piping and Structural Evaluation Program for the Byron Station Unit 1 - Rev. 3 dated October 29, 1982.

Changes incorporated into Rev. 3 are identified by the number 3 on the right hand margin of the applicable pages.

If you have any questions concerning the agreement, please don't hesitate to call.

Very truly yours,

WESTINGHOUSE ELECTRIC CORPORATION

W. E. Kortner, Manager  
Commonwealth Edison Projects

FCDiAgostino/deb

J. D. Deress 2L, 2A

cc: W. C. Cleff 2L, 2A

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PDR ADOCK 05000373  
PDR

INTERFACE CONTROL AGREEMENT  
WESTINGHOUSE PIPING AND STRUCTURAL EVALUATION PROGRAM  
FOR THE BYRON STATION UNIT 1

October 13, 1980

The provisions of this document have been reviewed and agreed upon by each of the undersigned parties.

WESTINGHOUSE W.E. Kortner Date 10/13/80  
COMMONWEALTH EDISON J.T. Kusuminski DATE 10-17-80  
SARGENT & LUNDY R. La Valle DATE 10-17-80

REVISION	DATE	WESTINGHOUSE	COMMONWEALTH EDISON	SARGENT & LUNDY
1	11/14/80	W.S. Foster	J.T. Westerman	J.T. Westerman
2 (p/6)	1/8/81	W.S. Foster	J.T. Westerman	J.T. Westerman
3	10/29/82	M. J. F. W. E. K.	J.T. Westerman	J.T. Westerman

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WESTINGHOUSE PIPING AND STRUCTURAL EVALUATION PROGRAM  
FOR THE BYRON STATION UNIT 1

1.0 INTRODUCTION

The purpose of this Interface Control Agreement is to define the relationship between the participating work groups and to describe how the Westinghouse Structural and Equipment Engineering Department will provide engineering required for the analysis and qualification of the piping and piping structures within its defined scope as delineated in Section 2. To perform this analysis, the Structural and Equipment Engineering Department has elected to provide engineers and technicians to perform this work in the engineering offices in Pittsburgh, Pennsylvania, Schaumburg, Illinois, and at the Byron site. All of the engineers and technicians assigned to this project are under the cognizance of the Westinghouse Nuclear Technology Division, Structural and Equipment Engineering Department.

Work is performed under this program to assure that (a) the analysis and (b) the as-built configuration of the piping and support systems are correct as shown by appropriate documentation, i.e. final isometric drawings for piping systems, approved structural design drawings for piping supports.

The piping analysis and piping support design work being performed by Westinghouse is a continuation of the design effort initially performed by Sargent & Lundy Engineers. The Westinghouse engineering work initially is based on the controlled project documents that were in place at the time of the transfer of the piping analysis work from Sargent & Lundy to Westinghouse. This controlled information includes the S & L single line piping drawings and the support structure drawings in existence when Westinghouse commenced its engineering effort. In order to achieve more realistic description of the piping systems and analysis, it has been agreed that Commonwealth Edison (CECo) will supply to Westinghouse as controlled design information the fabrication isometric drawings which will then become the controlled input for the piping qualification.

The piping analysis performed by Westinghouse is done using automated interactive graphics piping analysis methods. These methods use mini-computers both at the Byron site and at the Structural and Equipment Engineering Department offices in Pittsburgh, Pennsylvania and Schaumburg, Illinois. The piping engineer (either at the site or office) develops piping models directly from the fabrication isometric drawings using the mini-computer interactive graphics system. Upon completion of the analysis models, an engineering check is performed by an engineer that did not participate in the formulation of the particular model.

The analysis then proceeds by transferring the mini-computer information to the Westinghouse CDC 7600 or the CRAY computers in Pittsburgh. The results of this analysis provide piping stress levels and piping support loads. Upon achieving a satisfactory piping and support configuration, the piping support loads are provided to the piping support designers.

The piping supports previously designed by Sargent & Lundy are verified to see if they are capable of supporting the loads generated by the piping analysis. If so, the drawings are released for fabrication as Westinghouse drawings. If not, the piping support drawings are modified to reflect design changes. In the event that new support designs are required, these are made by the piping design group and original drawings prepared. When the drawing revisions or initial work of support drawings are approved, they are transmitted in accordance with the distribution needs for Commonwealth Edison through the Westinghouse Project Department Office.

The work process described above is independent of geographical location and is performed through the use of dedicated computers using interactive graphics techniques. The work location at the site, entitled the Westinghouse Structural Analysis Mobile Unit (SAMU) is directly coupled to the Pittsburgh and Midwest Nuclear Technology Center (MNTC) computers through dedicated data lines. Piping analysis functions can, therefore, be performed independently of geographical location by accessing the isometric models contained in computer memory. Support design also is performed independently of geographical location.

Westinghouse will provide the analysis to as-built piping and piping support conditions supplied to us by CECO. As part of the permanent records for the site, Westinghouse will provide the certified stress reports for the piping and support structures. Additionally, isometric drawings reflecting the as-analyzed geometry will be drawn by computer driven drafting machines as part of the stress reports.

Information regarding job status can be obtained in Pittsburgh, MNTC, or SAMU by accessing the Westinghouse computer network.

## 2.0 SCOPE

This interface agreement applies to the following work in the Westinghouse Scope of Supply.

The analysis and qualification (e.g. verification that the results of the analysis are within Code allowables) of Class A, B, C, and D piping (ANS Safety Class 1, 2, 3, and Non-Nuclear Safety respectively) systems within the Containment Building and the Auxiliary Building for the Byron Unit 1 station. The scope includes all lines in the Containment Building except as noted below. In addition, the scope includes four systems (CV, CS, SI, and RH plus additional coupled piping necessary to adequately evaluate these four systems) in the Auxiliary Building plus most of the piping within Area 5 of the Auxiliary Building for a total of approximately 550 large and small bore piping systems. This includes the associated design and qualification for the piping supports and restraints. The only piping and support systems specifically excluded from this document are (1) the Reactor Coolant Loop, (2) the primary equipment component supports, (3) containment spray piping systems 1CS01 and 1CS02, and (4) the Component Cooling, Fire Protection, and Service Water systems in Area 5. The Westinghouse scope in the Auxiliary Building is defined by the baseline document identified in Appendix 2.



All containment piping and supports will be analyzed and qualified in accordance with the requirements of Section III of the 1977 ASME Boiler and Pressure Vessel Code, through Summer 1979 Addenda. In addition, all supports for containment piping systems will be designed in accordance with Section III of the 1977 ASME Code, Summer 1979 Addenda. This scope of the applicability of the Codes referenced in this paragraph does not apply to the installation and fabrication of the piping and supports.

### 3.0 DEFINITIONS

Engineering Change Notice (ECN). A procedure for changing Design Drawings within the Westinghouse Scope as described in this agreement.

Field Change Request (FCR). A procedure for controlling field changes initiated by Commonwealth Edison Company.

### 4.0 ORGANIZATION

4.1 For the Piping and Structural Evaluation Program, Westinghouse Electric Corporation is represented by the Nuclear Operations Division (NOD) Projects Department and Nuclear Technology Division (NTD) Structural and Equipment Engineering Department and the Nuclear Technology Division Product Assurance Department. Westinghouse NOD is located at the Monroeville Nuclear Center, Pittsburgh, Pennsylvania. The NTD Product Assurance Department is based at the Penn Center Site in Pittsburgh, Pennsylvania, and the NTD Structural and Equipment Engineering Department is located in Pittsburgh, Pennsylvania, with satellite offices in Tampa, Florida, and Schaumburg, Illinois. The Westinghouse Structural Analysis Mobile Unit located at the Byron Site is a satellite office of the Structural and Equipment Engineering Department.

The Westinghouse organization is formally described in WCAP 8370, Section 17.1.1 and changes are distributed to controlled manual holders.

4.2 Sargent & Lundy Engineers, Chicago, Illinois, is represented by the Project Management Division.

4.3 Commonwealth Edison Company (CECo) is represented by the Byron Engineering Organization and the Byron Site Construction Organization. The Byron Project Engineering Organization, as the Owner, has the overall responsibility for the activities described in this agreement.

### 5.0 RESPONSIBILITIES

#### 5.1 Piping Qualification

The responsibilities for each phase of work associated with piping analysis and stress qualification are shown in Appendix 1, Figure 1. This chart lists the various piping analysis tasks and shows organizational responsibility for each work item associated with the analysis and qualification of the piping system.



## 5.2 Support Design and Qualification

The responsibilities for each phase of work associated with support and pipe whip restraints design and qualification are shown in Appendix 1, Figure 2. This chart defines the responsibility for each work item associated with the design and qualification of piping system supports. | 3

## 5.3 Quality Assurance

The responsibilities for Quality Assurance and issuance of design documents for this project are shown in Appendix 1, Figure 3. | 3

The Quality Assurance Program for Westinghouse activities at Westinghouse locations is defined by the current revision of the following documents.

WCAP 8370	WRD Quality Assurance Plan
WCAP 9550	WRD NSSS Policies and Procedures Manual
WCAP 9625	NTD ASME Quality Assurance Manual
WCAP 9565	NTD Design Control Manual
WCAP 8654	Quality Assurance Records Documentation Plan
WCAP 9805	SEED Policies and Procedures Manual

The latest revisions are applicable and available at the W satellite office located at the plant site.

QA records will follow the procedure of F2702 and WCAP 8654.

## 5.4 Westinghouse Structural Analysis Mobile Unit (W SAMU)

The Westinghouse Structural Analysis Mobile Unit is an extension of the Westinghouse Structural and Equipment Engineering Department located in Pittsburgh, Pennsylvania. The activities of the W SAMU are managed by the W manager assigned to the SAMU facility and provide Design activities under the procedures in Section 5.3.

## 6.0 PROJECT CORRESPONDENCE

- 6.1 All project correspondence from Westinghouse shall be through the W NOD Project Department in accordance with the Byron project Distribution listing.
- 6.2 All project correspondence from Sargent & Lundy will be controlled by the S & L Project Management Division.
- 6.3 All project correspondence from Commonwealth Edison shall be through Project Engineering Organization or Byron Site Construction as appropriate.

## 7.0 INTERFACE PROCEDURE DESCRIPTIONS

Procedures prescribing the activities described in this agreement are contained in the documents listed in Section 5.3 and SEED 1.4 entitled Engineering Change Notice and SEED 1.5 Field Change Requests.

The latest revisions of these procedures are applicable and available at the W SAMU office. Unless specified otherwise in this agreement, all design documents distributed by Westinghouse shall be distributed through the NOD Projects Department.

### 7.1 Engineering Change Notices (ECN)

ECN's Issued by Westinghouse will be in accordance with the Westinghouse procedure SEED 1.4.

### 7.2 Field Change Requests (FCR)

All FCR's Issued by Commonwealth Edison will be in accordance with CEC's procedure QP 3.2 and W is considered the AE with respect to action required within the scope of QP 3.2.

### 7.3 Support Design Drawing

The standard distribution for support drawings shall be in accordance with the controlled distribution list maintained by W NOD Projects Department.

### 7.4 Piping Isometric Drawings

Piping Isometric drawings shall be Issued to the W SAMU office by FCR and from Commonwealth Edison Construction as design input for W piping analysis.

### 7.5 Other Engineering Documentation

W Engineering documents and reports will be Issued as required by W NOD Projects Department.

## 8.0 REFERENCES

### 8.1 W INTERNAL DOCUMENT

WCAP 8370	WRD Quality Assurance Plan
WCAP 8654	Quality Assurance Records Documentation Plan
WCAP 9550	WRD NSSS Policies and Procedures Manual
WCAP 9565	NTD Design Control Manual
WCAP 9625	NTD ASME Quality Assurance Manual
WCAP 9805	SEED Policies and Procedures Manual

### 8.2 SUPPLEMENTARY DOCUMENTS

Interface Control Agreement Supplement between Westinghouse SAMU-1, NPS, CEC, and S&L. Rev. 1.

## APPENDIX 1

## INTERFACE RESPONSIBILITY MATRICES

Figure 1 - Piping Responsibility Matrix

Figure 2 - Support Responsibility Matrix

Figure 3 - Design Document Responsibility

## LEGEND

C - Commonwealth Edison Company

S - Sargent & Lundy Corporation

W - Westinghouse Electric Corporation

FIGURE 1  
BYRON UNIT 1  
PIPING RESPONSIBILITY MATRIX

NO.	ACTIVITY	CLASS A	CLASS B	CLASS C	CLASS D
1	Qualification Analysis	W	W	W	W
2	Certified Stress Report	W	W	W	N/A
3	Third Party Review of Certified Stress Report	W	W	W	N/A
4	Specify High Energy Pipe Break Locations	W	W	W	W
5	Specify Pipe Support Loadings	W	W	W	W
6	Provide Overpressurization Protection Report	W	W	W	N/A
7	Provide Thermal/Hydraulic Parameters for Penetration Analysis	W	W	W	W
8	Specify Pipe Mechanical Loadings at Penetrations	W	W	W	W
9	Provide MS & FW Hydraulic Forcing Functions	W	W	W	W
10	Provide Allowable Nozzle Loads for <del>W</del> Equipment	W	W	W	W
11	Provide Allowable Nozzle Loads for Non- <del>W</del> Equipment	S	S	S	S
12	Provide Seismic Response Spectra	S	S	S	S
13	Provide Anchor Motions at all Penetrations	S	S	S	S

3

3

14	Provide Certified E-Specs for <u>W</u> Equipment	W	W	W	W
15	Provide Certified E-Specs for Non- <u>W</u> Equipment	S	S	S	S

FIGURE 2  
BYRON UNIT 1  
SUPPORT RESPONSIBILITY MATRIX

NO.	ACTIVITY	CLASS A	CLASS B	CLASS C	CLASS D		
1	PIPE SUPPORT DESIGN	W	W	W	W		
2	PIPE SUPPORT ANALYSIS	W	W	W	W		
3	CERTIFIED STRESS REPORT	W	W	W	N/A		3
4	PIPE WHIP RESTRAINT DESIGN & ANALYSIS	W/S	W/S	W/S	W/S		3
5	PROVIDE LOADING AT PIPE SUPPORT BASE PLATES, EMBEDS, & STRUCTURAL STEEL ATTACHMENTS	W	W	W	W		
6	PROVIDE DESIGN, ANALYSIS, AND QUALIFICATION OF BASE PLATES	W	W	W	W		3
7	PROVIDE DESIGN, ANALYSIS, & QUALIFICATION OF EMBEDS, AND SUPPORTING STRUCTURAL STEEL OR CONCRETE	S	S	S	S		3
8	PROVIDE DESIGN, ANALYSIS & CERTIFIED STRESS REPORT FOR ALL PRIMARY CONTAINMENT PENETRATIONS	S	S	S	S		3
10	RELEASE SUPPORT DRAWINGS FOR FABRICATION	W	W	W	W		
11	THIRD PARTY REVIEW OF CERTIFIED STRESS REPORT	W	W	W	N/A		

FIGURE 3  
BYRON UNIT 1  
DESIGN DOCUMENT RESPONSIBILITIES

NO.	ACTIVITY	CLASS A	CLASS B	CLASS C	CLASS D
1	Piping and Support Design Specifications	W	W	W	N/A
2	Piping and Support Fabrication Specifications	S	S	S	S
3	Piping and Support Installation Specifications	S	S	S	S
4	QA Review of Westinghouse Design Specifications	W	W	W	W
5	Code Data Reports	C	C	C	N/A
6	QA Audit of Westinghouse Design Activities	W	W	W	W
7	Initiate Applicable Field Change Requests	C	C	C	C
8	Review and Resolve Applicable Field Change Requests	W	W	W	W
9	Initiate Westinghouse Engineering Change Notices (ECN)	W	W	W	W
10	Provide Non-Westinghouse Equipment Drawings	S	S	S	S
11	Provide Listings of Initial Design Drawings, Line Numbers, Valves, Supports, Components	S	S	S	S
12	Provide 'As-Built' Measurements of Piping System and Supports, Including Geometry, Location, and Orientation	C	C	C	C



FIGURE 3 (Con't)

NO.	ACTIVITY	CLASS A	CLASS B	CLASS C	CLASS D	
13	Provide Design Control Over the Following Documents:					
	* P & ID	S	S	S	S	
	* Pipe Support Drawings	W	W	W	W	3
	* Provide Construction and As-Built Piping Isometrics	C	C	C	C	
	* Pipe Whip Restraint Drawings	W	W	W	W	3
14	Provide data base of <del>W</del> developed PAGES computer base Piping Models and load input in the input format of the S&L computer program PIPSYS based on PIPSYS user manual Revision 5, April 1982.	W	W	W	W	3

## APPENDIX 2

### BASE LINE DOCUMENT

The P & ID Drawing prepared by Sargent & Lundy serves as the record of Interfaces for the Byron plant Auxillary Building. By means of appropriate color coding and affixation of serialized numbers, the work scope for piping analysis and supports design of Sargent & Lundy, Westinghouse, and Nuclear Power Services (NPS) are Identified. Controlled copies of the P & ID's will be maintained at the construction site by Sargent & Lundy under direction of Commonwealth construction. These copies will be maintained in real time to correspond with the progress of construction activities, analysis activities, and preparation of design drawings. For systems which contain shared scope, anchor locations (see next item) will be Identified on the P & ID with appropriate designation of responsibility on either side of the anchor.

3

### ANCHOR LOCATIONS

A sketch will be prepared by Westinghouse which specifies anchor locations at locations of scope/responsibility changes. These anchor location sketches will identify which organization is responsible at the anchor and in either direction extending away from the anchor. The anchor schematic diagrams will be serialized such that they are identified on the P & ID's (see above).

3

## APPENDIX 3

### INTERFACE CONTROL AGREEMENT ADDENDUM SITE

#### 1.0 INTRODUCTION

The purpose of this interface document is to define the relationship between the Westinghouse Structural Analysis Mobile Unit (SAMU) design group and the Sargent & Lundy (S & L) Piping/Support/Analysis field group. Either S & L or SAMU may interface with and/or perform design tasks for resolution of field problems in the other's scope of assigned subsystems. The overall responsibility for the work performed will reside with the respective party presently assigned that subsystem.

This appendix supplements the Westinghouse - Commonwealth Edison Company - Sargent & Lundy Interface Control Agreement.

#### 2.0 SCOPE

This Interface Control Agreement Appendix applies to work activities between Westinghouse and Sargent & Lundy at the Byron Site. All design activities will be performed in accordance with the respective CECO approved SAMU or S & L Q. A. program(s) and applicable procedures which are discussed in Section 5.3 of this Interface Control Agreement.

#### 2.1 RESPONSIBILITIES

Field Problems will be received by the field group that is presently assigned that subsystem responsibility. The assignment of the field problems for resolution (re-design, calculations, analytical check), upon notification by CECO to S & L and Westinghouse SAMU, may be to either on-site work group. The specific assignment of which field problems to reassign shall reside with the site group presently assigned the subsystems having outstanding field problems. Reconciliation of out-of-tolerances will remain the responsibility of the group assigned the subsystem.

Appropriate design input information needed to resolve the field problems will be provided with the problem or access to the information will be made available. (Proprietary information excluded.)

Cross-training will be provided in areas where differences in procedures and design requirements or methods exist. Documented records of cross-training and documentation of personnel qualification will be maintained by the respective parties. This documentation will be available for review.

All original design information, including calculations resulting from the problem resolution, will be supplied to the responsible field group with the resolution. The responsible field group will maintain records as required and will issue the revised hanger drawings.

### 2.3 CECO RESPONSIBILITIES

CECo will establish the completion priorities for subsystems as the scheduling dictates and will monitor the work load for all Field Groups.

APRIL 8, 1983 LETTER FROM A. STONE IS IN PREPARATION.

NPS DESIGN CONTROL PROCEDURE IS ATTACHED.

WORK PROCEDURE 3.0.4

PP