71-9090 PDR

UNION CARBIDE CORPORATION
NUCLEAR DIVISION
P. O. BOX 1410, PADUCAH, KENTUCKY 42001

January 12, 1979

DOCKETED
USNRC
JAN 17 1979

United States Nuclear Regulatory
Commission
Attention: Mr. Charles E. MacDonald
Chief, Transportation Branch
Washington, D.C. 20555

Gentlemen:

Type 48H Cylinders

Transmitted herewith are seven copies of Drawing E-M-14864-A, Rev. B, Equipment Specification No. JSP-553, Rev. 2, Table I, letter dated December 1, 1978, C. C. Hayes to Modern Welding Company, and letter dated December 13, 1978, C. C. Hayes to Modern Welding Company (Purchase Order 88G-53277V).

Sincerely,

D. H. Stitt, Department Superintendent
Mechanical Engineering

DHS:cp

Enclosures: Drawing E-M-14864-A, Rev. B (7)
Equipment Specification No. JSP-553, Rev. 2 (7)
Table I (7)
Letter (December 1, 1978)(7)
Letter (December 13, 1978) (7)

PRIORITY MAIL

cc: D. L. Castro
W. C. Taylor
File - NoRC

7901240 355

UNION CARBIDE CORPORATION
NUCLEAR DIVISION
P. O. BOX M, OAK RIDGE, TENNESSEE 37830

December 13, 1978

Modern Welding Company, Inc.
1500 East 12th Street
Owensboro KY 42301

Attention: Larry Chapman

Re: Purchase Order 88G-53277V

Gentlemen:

Confirming our conversation of December 11, 1978, you are authorized to:

1) Fabricate the skirts from A36 material.
2) Fabricate a sufficient quantity of set screws to expedite delivery. A36 or 1045 or any suitable material with hardened point may be used.
3) Use the plugs that were procured for the 48G cylinder if necessary in order to start production by December 18, 1978.

You are authorized to use .-1/16" + 1/4" tolerance on the plug end skirt of the 48H cylinder.

On the value guard, you are authorized to use a fillet weld.

Use Horizontal Lifting Lug shown on Drawing E-M-14864A, Rev. B.

If you have any questions, please let me know.

Very truly yours,

C. C. Hayes

Purchasing Division

CCHayes/efh

cc: Frank Guzzy - PAD

11710

UNION CARBIDE CORPORATION
NUCLEAR DIVISION
P. O. BOX M, OAK RIDGE, TENNESSEE 37830

December 1, 1978

Modern Welding Company
Attention: Mr. Larry Chapman
1500 East 12th Street
Owensboro KY 42301

Re: Purchase Order 88G-53277V

Gentlemen:

Confirming our telephone conversation of this date, we are ordering the following changes on Purchase Order 88G-53277V under the "Changes" article No. 29 of our Terms and Conditions designated L 7-1-73.

Reduce the quantity of the 48G Tails Cylinders (Items 002, 002A and 002B) by 1000 cylinders. This leaves a total of 3,000 48G tails cylinders on this order.

Add another item of 1000 Type 48H Skirted Cylinders to be delivered to the Paducah, Kentucky plant, at the rate of 200 per month starting as soon as possible.

The following provisions will apply:

1. The 1000 Type 48H cylinders are to be fabricated as per UCC-ND drawing E-M-14864A, Rev. B except that the material of construction for the cylinder shell, heads, and skirts shall be ASTM A285, Grade C and the lifting lugs, valve guard, and stiffening rings shall be ASTM 36.

2. The plug location on the remaining Type 48G tails cylinders shall be 17" + 1/8 instead of 19" $\pm$ 1/8 as shown on UCC-ND drawing E-M-14863A, Rev. 1.

3. All remaining Type 48G tails cylinders are to be fabricated with the alternate lifting lug as detailed on UCC-ND drawing E-M-14863A, Rev. 1.

4. A steel plug of similar dimensions may be used for the Type 48H cylinders if it can be obtained in a more reasonable time frame than that estimated for the aluminum bronze plug.

5. The numbering of the Type 48H cylinders shall start with 150001.

Cost and Pricing Data on these changes will be required. Forms are enclosed.

Please give me your proposal or claim within thirty days, or as soon as possible.

Very truly yours,

C C. Hayes

Purchasing Division

CCHayes/efh

Enclosures

cc: Byron Kress - Paducah
F. D. Guzzy - Paducah
Troy Trotter - K-25

TABLE I

Type 48H Cylinder - Deviations from Equipment Specification ES-CMD-14864-1 and Drawing E-M-14864-A, R-0

ITEM	SPECIFIED	DEVIATION	REFERENCE
Head-to-shell weld	Butt-weld with backup bar	Off-set weld Similar to 48G	E-M-14864-A, Rev. 0
Head and shell material	ASTM A-516 Grade 55, 60, or 65	ASTM A-285 Grade C	ES-CMD-14864-1
All other material	ASTM A-516 Grade 55, 60, or 65	ASTM A-36	ES-CMD-14864-1
Impact test results	Meets ASTM A-20 for ASTM A-516	Not required	ES-CMD-14864-1

EQUIPMENT SPECIFICATION

UNION CARBIDE CORPORATION
NUCLEAR DIVISION
OAK RIDGE, TENN. – PADUCAH, KY.

SPECIFICATION NO.	REV.
JSP-553	2
ISSUE DATE: 7-1-76	REVISION DATE: 10-11-77
WORK ORDER NO. (ESO, ETC.): RCD 14863 R	
PROCURED BY: UCC-ND	INSTALLED BY: UCC-ND R
BUILDING: Area	PLANT: PGDP R

SPECIFICATION FOR: TYPE 48G UF_6 STORAGE CYLINDERS

PROJECT (JOB) TITLE: Cylinders, Type '0M', Area - PGDP (FY-77)

ENGINEERING AND PLANT APPROVALS

SIGNATURE	DATE	SIGNATURE	DATE
Prepared By R. L. Echols R. L. Echols	7-1-76	Principal Engineer R. L. Echols R. L. Echols	7-6-76
Approved By C. H. Green C. H. Green	7-6-76	Facility (Project) Engineer S. Bernstein S. Bernstein	7-6-76
Division (Department) R. L. Echols R. L. Echols	7-6-76	Plant Division Representative J. K. Phipps J. K. Phipps	7/6/76

PROJECT APPROVALS

SIGNATURE	DATE	SIGNATURE	DATE

REVISIONS

NO.	DESCRIPTION	APPROVAL SIGNATURE	DATE
1	Revised 6.4.1.c. to include torque and thread count in vendor certification data	W. C. Taylor W. C. Taylor	3-9-77
2	Updated 2.1, revised plug material and coupling, updated Company scale, etc.	L. A. Crews L. A. Crews	8-19-77

UCN-11191
(1238 6-74)

EQUIPMENT SPECIFICATION

UNION CARBIDE CORPORATION
NUCLEAR DIVISION
OAK RIDGE, TENN. - PADUCAH, KY.

SPECIFICATION NO.	REV.
JSP-553	2
ISSUE DATE	REVISION DATE
7-1-76	10-11-77
PLANT	PAGE
PGDP	1 OF 9

SPECIFICATION FOR
Type 48G UF_6 Storage Cylinders R

TABLE OF CONTENTS

SECTION		PAGE
1.	SCOPE.	2
2.	REFERENCES	2
3.	DESIGN SPECIFICATIONS.	2
4.	QUALITY CONTROL.	4
5.	MANUFACTURING.	4
6.	CERTIFICATION.	7
7.	DEFECT REPAIR.	7
8.	ACCEPTANCE	8
9.	SHOP DRAWINGS AND MANUFACTURER'S DATA..	8
	Manufacturer's Data Required . . .	9

EQUIPMENT SPECIFICATION

UNION CARBIDE CORPORATION
NUCLEAR DIVISION
OAK RIDGE, TENN. - PADUCAH, KY.

SPECIFICATION NO.	REV.
JSP-553	2
ISSUE DATE	REVISION DATE
7-1-76	10-11-77
PLANT	PAGE
PGDP	2 OF 9

1. SCOPE

1.1 This specification establishes the requirements for the fabrication, cleaning, testing, painting and inspection of Type 48G cylinders which are to be used for UF_6 storage. R

2. REFERENCES

2.1 The latest revisions of the following referenced documents are hereby made a part of this specification: R

a. UCC-ND Drawing E-M-14863-A, Cylinder, Type 48G
b. UCC-ND Drawing E-J-11246, 1" Size Valve for UF_6 Cylinder
c. UCC-ND Job Specification JSP-532, Specification for a 1" Angle Drum Valve for UF_6 Service
d. ASME Boiler and Pressure Vessel Code Section VIII, Division 1, Pressure Vessels and Section IX, Welding and Brazing Qualifications, (hereinafter referred to as "The Code")
e. ASTM Material Specifications A36, A105, A167, A285, B32 and B150
f. ANSI Standards B2.1, B16.11 and B57.1.

3. DESIGN SPECIFICATIONS

3.1 General Considerations

3.1.1 The cylinders to be furnished under this specification are to be utilized for the storage of uranium hexafluoride (UF_6). In addition to the specific requirements of this specification, the cylinders furnished must conform to the applicable requirements of the referenced standards.

3.2 Detailed Requirements

3.2.1 Working Pressure

The cylinder shall be constructed to withstand working pressures of 100 psig internal at 235°F, and 15 psig external at 235°F.

3.2.2 Materials of Construction

3.2.2.1 Cylinder Shell and Head

Steel shall conform to ASTM A285, Grade C. All other steel shall conform to ASTM A36, unless otherwise noted.

3.2.2.2 Pipe Plug R

Upset forged or extruded or extruded and drawn aluminum bronze CDA Alloy 614 conforming to ASTM B150 with 0.2 - 0.3% tin by weight. Plugs shall have solid hex-head, with 1-inch - 11-1/2 NPT (National Pipe Threads) conforming to ANSI B2.1. After machining, the plugs shall be stress relieved for at least one hour at 800°F minimum.

3.2.2.3 Couplings R

Forged steel conforming to ASTM A105, 1-inch half-coupling, 6,000 lb, conforming to ANSI B16.11. The couplings shall be tapped with a 1-inch - 11-1/2 NPT (National Pipe Thread) tap. Proportions and limits of the threads shall be as described in ANSI B57.1. Couplings shall be counterbored as detailed on Drawing E-M-14863-A. (Also see 5.4 - Valve Installation and 5.5 - Plug Installation.)

3.2.2.4 Solder R

ASTM B32, Tin-Lead Alloy 50A.

3.2.2.5 Nameplate R

Stainless steel, 13 gage, ASTM A167, Type 304.

3.2.2 Testing

3.2.3.1 Hydrostatic

Each cylinder shall be tested at 200 psig cylinder pressure. The test pressure shall be maintained during inspection of all joints. If leakage is detected, repairs shall be made only as permitted by and in accordance with the ASME Code, and the cylinder shall be retested after the repairs are complete.

3.2.3.2 Air

Following the cleaning, hydrostatic testing, drying and plug and valve installation, each cylinder shall be pressurized to 10 psig using filtered dry air (-40°F dew point as measured with an Alnor dew point meter). The cylinders shall be soap tested for leaks around the valve and plug threads and then pressurized to 50 psig. While under 50 psig pressure, all welds and the plug and valve connections shall be soap tested with no leakage being permitted. Any welded repair must be followed by reapplication of the hydrostatic test, cleaning, drying, and air test. R R

3.2.3.3 Vacuum

The cylinder shall be prepared for painting and shipment by reducing the pressure to 20 inches Hg vacuum minimum. An air jet ejector is suggested for this purpose. R

4. QUALITY CONTROL

4.1 Procedures

4.1.1 The Seller shall establish and maintain written quality control procedures for manufacturing, cleaning, inspecting, equipment calibration, and testing to assure that the finished product meets the requirements of this specification. Such procedures may consist of, or be based upon, the Seller's written specifications for like practices; or, shall be developed to meet the requirements of this specification. Industry standards, together with a program of frequent inspection and verification of the Seller's adherence to such standards are acceptable. R

4.2 Approvals

4.2.1 The Seller shall, prior to the start of fabrication, submit copies of his proposed procedures to the Company for approval. Changes in approved procedures may not be made during manufacture without prior written approval by the Company. The Company shall be notified five days in advance of the start of fabrication to allow a Company representative to witness initial production, and shall be permitted access to the manufacturing facilities at any reasonable time to verify that the quality control procedures are being implemented in manufacturing.

4.3 Subcontractors R

4.3.1 The requirements for certification of materials and control of quality through inspection shall be imposed by the Seller on his subcontractors, if any. R

5. MANUFACTURING

5.1 Fabrication

5.1.1 Cylinders shall be fabricated in accordance with Section VIII, Division 1, "Pressure Vessels", of the latest edition of the ASME Boiler and Pressure Vessel Code and shall be code stamped. All welders and welding procedures shall be qualified in accordance with Section IX, "Welding and Brazing Qualifications", of the same code. R R

5.2 X-ray Examination

5.2.1 A minimum of one spot X-ray examination per cylinder shall be made in accordance with Section UW-52 of the Code using a fine grain X-ray film (Kodak Type AA, or Company-approved equivalent). Locations of the spot shall be at the juncture of the longitudinal seam and the circumferential head weld, alternating ends for successive cylinders. Any weld imperfections indicated by the radiographs shall not exceed those permitted by Section UW-52 (except for porosity, which shall be required to meet UW-51) of the Code.

5.3 Cleaning

5.3.1 The inside of the cylinder shall be thoroughly cleaned of all grease, oil, scale, slag, loose oxides, dirt, moisture, and other foreign matter. The surfaces shall be left clean, dry, and free of all contamination, except a thin coating of iron oxide from hydro-testing. The detailed cleaning procedure proposed shall be submitted for the Company's approval before fabrication is started. A signed cleaning certification form for each cylinder shall be submitted to the Company.

5.4 Valve Installation

5.4.1 Valves will be supplied to the Seller by the Company with valve threads already tinned with a thin uniform coating of ASTM B32 Alloy 50A solder. The dimensions of the valves are shown on the referenced drawing. The threaded portion of the valve which will be installed in the cylinder coupling is cut with approximately 13 - 14 complete threads.

5.4.2 The 1-inch - 6,000 lb half-coupling into which the valve is to be installed shall be threaded as specified under Section 3.2.2. The thread depth shall be sufficient to permit the coupling to accept a minimum of seven and a maximum of 12 valve threads. Couplings are to be furnished by the Seller.

5.4.3 The valve coupling threads shall be chased with a 1" - 11-1/2 NGT tap after being welded to the vessel head. R

5.4.4 The valve thread engagement shall be obtained using a minimum of 150 and not more than 400 ft-lb of wrench torque. Torque wrench shall be applied to the valve body and not to the bonnet nut. An indicating torque wrench shall be used for valve installation. No material of any kind, other than the specified solder, shall be used on the threads to facilitate installation.

5.5 Plug Installation

5.5.1 Plug threads shall be tinned with a thin uniform coating of ASTM B32, Alloy 50A solder before installation. No material of any kind, other than the specified solder, shall be used on the threads to facilitate installation. A minimum of five threads shall be engaged. Plugs shall be furnished by the Seller. R

5.5.2 The plug coupling threads shall be chased with a 1" - 11-1/2 NGT tap after being welded to the vessel head. R

5.6 Cylinder Capacity

5.6.1 The Seller shall determine the capacity of each cylinder by completely filling the cylinder with water. The weight of water contained in the cylinder and the water temperature shall be recorded. The cylinder shall have a minimum water capacity (corrected to 60°F) of 8,670 lb of water (139.0 ft^3). Upon completion of fabrication, painting, and evacuation of the cylinder, the tare weight of each cylinder shall be determined. The water capacity in pounds of water at 60°F after tare weight shall be stamped on the nameplate of the cylinder. The Seller shall submit to the Company for approval the procedure for this operation before starting fabrication. R

5.7 Identification

5.7.1 Each cylinder shall have a stainless steel nameplate, as shown on the referenced drawing, permanently attached to the cylinder. The nameplate shall state the serial number of each cylinder, numbered consecutively, starting with a six digit number specified by the Company. R

5.8 Painting

5.8.1 After interior cleaning and all testing has been completed, the exterior of the cylinder shall be cleaned and prepared for painting. Before painting, the exterior surface shall be free from all foreign material such as oil, grease, soap, loose mill scale, welding slag, and moisture. The cylinder shall be primed with one coat of zinc chromate, Pittsburgh No. 6-204, or approved equal, and finish painted with one coat of Avocado, Pittsburgh No. 54-304, or approved equal. The valve and nameplate shall be completely masked so that no part is painted. R

6. CERTIFICATION

6.1 Mill Tests

6.1.1 The Seller shall furnish to the Company one certified copy of mill test reports including chemical and physical analyses on each heat of material used in fabricating cylinders. Serial numbers of cylinders shall be identified as to heat number of materials used in the cylinder fabrication.

6.2 Inspection and Testing

6.2.1 The Seller shall furnish to the Company one completed copy of the manufacturer's data sheet ASME Form U-1 for each cylinder. The Seller shall also furnish to the Company certification that each cylinder has passed the air-soap test as specified in 3.2.3.2.

6.3 Capacity Statement

6.3.1 The Seller shall submit to the Company the calculations used to determine the water capacity of each cylinder.

6.4 Miscellaneous Certifications

6.4.1 The Seller shall submit to the Company for each cylinder a verification of performance for:

a. Section 5.2 "X-ray Examination"
b. Section 5.3 "Cleaning"
c. Section 5.4 "Valve Installation", data indicating the actual torque applied and the actual number of threads showing after installation.

6.5 Certification Package

6.5.1 The Seller shall submit to the Company all required certification data, as a "Package", indentified by the Company cylinder number.

7. DEFECT REPAIR

7.1 Repair of all defects failing to comply with this specification and retesting shall be at the Seller's expense.

8. ACCEPTANCE

8.1 Final acceptance will be at the designated DOE plant. Acceptance will be based on (1) review of the Seller's certified test reports; (2) visual inspection of workmanship, cleanliness, and the condition of all attachments; (3) cylinder dimensional inspection; and (4) cylinder vacuum check. Failure to meet any of the above requirements shall be cause for rejection of the cylinder. R

9. SHOP DRAWINGS AND MANUFACTURER'S DATA

9.1 The Seller shall furnish the Company shop drawings and manufacturer's data as specified on the "Manufacturer's Data Required" form on page 9 of this specification. Only after the Company's approval shall the Seller proceed with fabrication.

MANUFACTURER'S DATA REQUIRED

UNION CARBIDE CORPORATION
NUCLEAR DIVISION
OAK RIDGE, TENNESSEE 37830

SPEC. OR DATA SHEET NO. JSP-553 | REV. 2
PAGE 9 OF 9

DESCRIPTION AND EQUIPMENT NUMBERS

TYPE 48G UF_6 STORAGE CYLINDERS

THE SELLER SHALL FURNISH **DATA BELOW IN QUANTITIES SHOWN**	NUMBER OF COPIES						
				CERTIFIED AS BUILT COPIES			
	With Bids	For Approval	Advanced Engineering	Prints or Brochure	Transparency (Not Folded)	Packed W/ Equipment	
OUTLINE DIMENSION DWG. – INCLUDE TOTAL WT. OF EQUIPMENT		3			1		
ASSEMBLY DRAWINGS		3			1		
DETAIL DRAWINGS – MECHANICAL							
FLOW DIAGRAMS							
PANEL WIRING DIAGRAMS							
ELEMENTARY WIRING DIAGRAMS *(According to joint Industrial Council Std.)*							
INTERCONNECTING WIRING DIAGRAMS *(According to Joint Industrial Council Std.)*							
MATERIAL CERTIFICATION					1		
WELDING PROCEDURES		3			1		
OPERATING DATA AND PERFORMANCE CURVES							
TEST REPORTS AND INSPECTION REPORTS					1		
MANUFACTURERS DATA REPORT ON UNFIRED PRESSURE VESSELS *(National Board Certification of Inspection FORM U-1)*					1		
SPARE PARTS LIST – INCLUDING RECOMMENDATIONS FOR 1 YEAR *(Each part is to be described and identified in sufficient detail to permit procurement from the original manufacturer, or from any supplier).*							
OPERATING AND MAINTENANCE INSTRUCTIONS							
LUBRICATION INSTRUCTIONS							
RECOMMENDED PIPING AND INSTRUMENTATION							
INSTALLATION INSTRUCTIONS							
SCHEMATIC OR LOGIC DIAGRAMS *(Each component shall be described and identified in sufficient detail to permit procurement from the original manufacturer, or from any supplier).*							
Proposed Quality Control Procedures		3			1		R
Welding Qualifications		3			1		
Certifications (X-ray, Cleaning, Valve Installation)						1	R

GENERAL NOTES:

1. *Within weeks after award of subcontract the Seller shall furnish the required number of data and drawings "For Approval" and/or "Advance Engineering" as outlined in the table above. Subsequent revisions shall also be approved.* R

2. *"Certified Correct" data and drawings are required prior to delivery of equipment and/or material. Each copy of information shall be marked to indicate Company's Purchase Order No., Equipment No. and Manufacturer's Model and Serial No.*