

**Westinghouse Electric Co., LLC  
Columbia S.C.**

**Inspection report  
30B cylinder containing Uranium Hexafluoride  
OWNER'S # A103, NATIONAL BOARD # 5135**

**Issued by  
Carolina Materials Testing Company, Inc.  
Irmo S.C.**

**Carolina Materials Testing Company, Inc.**  
**Soils, Foundations, Materials**  
**and Non-Destructive Testing**

Telephone: 803-407-3336

Fax: 803-749-1718

CYLINDER #

OWNER'S # A103

DATE 5/15/2012

NAT'L BD# 5135

MFRG'S # 6499

MODEL # 30 B, CERT BY (W. H. STEWART CO.) CNEIC

BUILT: 7/1983

LAST RECERTIFICATION: 10/2005

**Reason for inspection:**

Visual observation finds circumference weld of skirt to cylinder at valve end shows unusual weld formation at root of weld, concern that this may be evidence of repair from unknown origin, a practice unacceptable by Boiler Pressure Vessel Code. (See photos 1 through 7.)

**Inspection:**

The weld in question was inspected with standard visual and 10 x magnifications, and compared to another 30B cylinder from the same manufacturer. This stringent observation was to find any indication the weld was not original factory weld. The rest of the cylinder was inspected to ANSI 14.1 SEC 6.3.2. (Periodic Inspection) in as much as can be performed before the cylinder is emptied.

After visual inspection of weld face and adjacent base metal with 10x magnification, no evidence of grinding, gouging, or turning marks were found, which would be used to remove weld filler metal before repair weld could be made. Further visual inspection finds root of weld to have melt-through as defined in American Welding Society A3.1:2001. This weld was compared to cylinder OWNER'S # A104, National Board #5136, MFRG'S #6500, CNEIC. This cylinder was manufactured by the same company with serial numbers showing them to be consecutive. (See attached photos) The rest of cylinder inspection included 31 thickness tests with readings and location shown on Figure 1.

This cylinder is filled with a Descote valve, serial number 588020. 5 Threads are exposed, indicating 9 threads are engaged, which meets the ANSI 14.1 requirement.

The back plug is stamped "5" on the plug. 4.5 threads are visible. The stamp most likely indicates that five threads are engaged. There is no way to determine how many threads are engaged until the cylinder is emptied and the back plug is removed.

**Inspection Conclusion:**

The visual inspection of weld face and adjoining base metal finds no signs of repair although the root weld may not present the aesthetics normally associated with type 30 B cylinders. After comparison with a second cylinder from the same manufacturer, it appears that the weld was not a repair but a normal part of fabrication for this manufacturer. Further visual and ultrasonic testing finds that the weld and wall thickness meets ANSI N14.1 requirements.

After emptying, this cylinder should undergo intensive internal inspection by video boroscope and undergo full recertification process, including replacement of the back plug.

Thank you for the opportunity to be of service. If you have any questions or comments, please call at 803-407-3336 (office) or 803-479-9570 (mobile) or email me at [jshah@ctsiengineering.com](mailto:jshah@ctsiengineering.com).

Sincerely,

**Carolina Materials Testing Company, INC.**

A handwritten signature in black ink, appearing to read 'J. Shah', with a stylized flourish at the end.

**Jack Shah**  
President

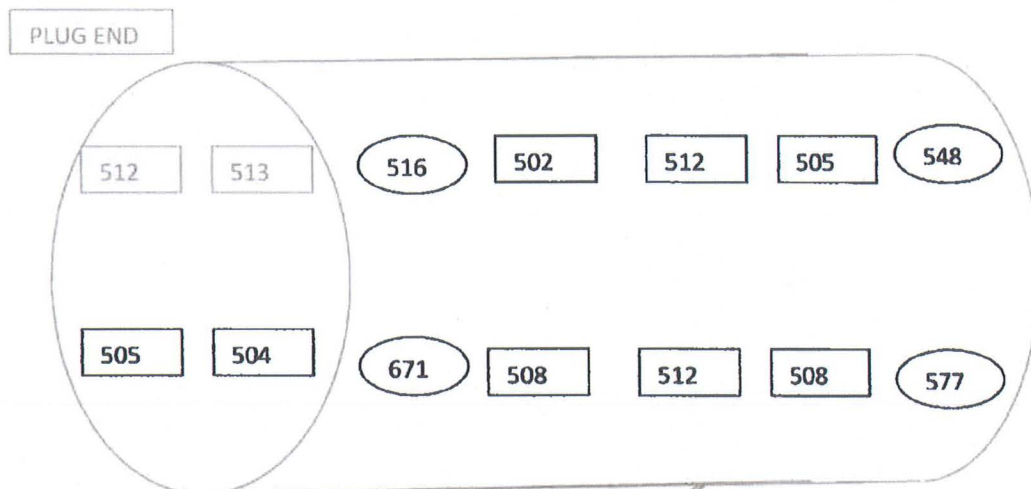
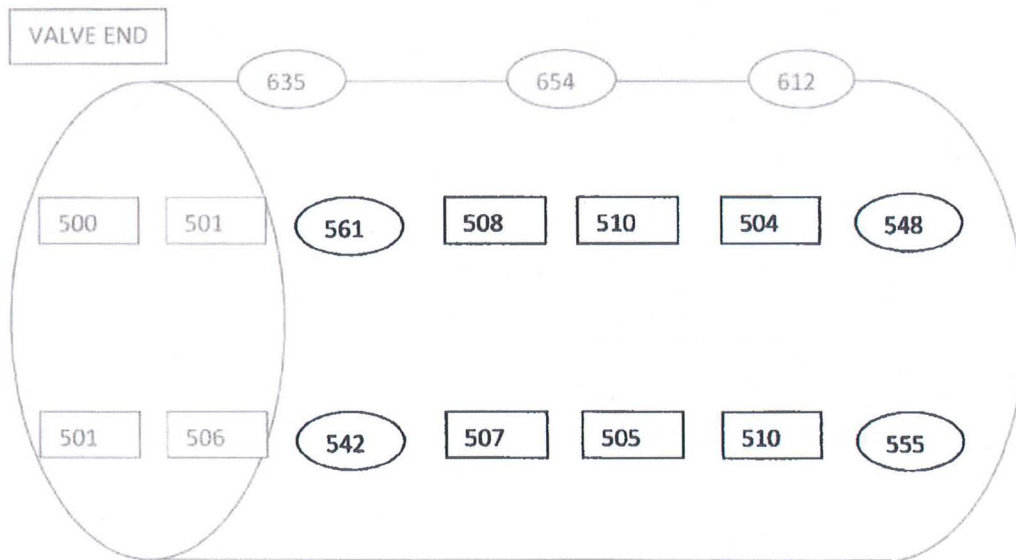
THICKNESS READINGS

DATE 4-16-2012

OWNER'S # A103, NAT'L BD #5135, MFGR'S # 6499

THICKNESS IN THOUSANDS OF AN INCH

○ INDICATES WELD THICKNESS



Robert G. Fisher Jr.

*Robert G. Fisher*

AWS CWI #05030191, South Carolina LLR License # 80



Robert G Fisher Jr.  
CWI 05030191  
QC1 EXP. 3/1/2014



MEGR # A-103

**FORM U-1A MANUFACTURERS' DATA REPORT FOR PRESSURE VESSELS**  
(Alternate Form for Single Chamber, Completely Shop-Fabricated Vessels Only)  
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured by W. H. Stewart Company, Oklahoma City, Oklahoma USA  
2. Manufactured for CNEIC BEIJING, PRC  
3. Location of Installation Portable  
4. Type Vertical 6499 n/a 135.0255 5135 (Year Built) 1983  
(Horiz. or vert. tank) (Mfg's Serial No.) (CRN) (Drawing No.) (Nat'l Bld No.)  
5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1 1980 and Addenda to 12-31-83 and Code Case Nos. na  
(Year) (Date)  
Special Service per UG-120(d) UCS-66 (c,2)  
Manufacturers' Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: n/a

6. Shell: Matl SA516 Gr. 55 500 in. Allow. n/a in. Diam. 30 ID in. Lgth. 4 ft 7-5/8 in.  
(Spec. No., Grade) (Nom. Thk.) (Corr. Allow.)  
7. Seams: Long. Butt weld Spot Efficiency 85 % H.T. Temp. n/a F Time n/a hr  
(Welded, Dbl, Sngl, Lap, Butt) (Spot or Full)  
Girth Sgl. Butt weld with backup bar R.T. spot No. of Courses 1  
(Welded, Dbl, Sngl, Lap, Butt) (Spot, Partial, or Full)  
8. Heads: (a) Material SA-516 Gr. 55 (b) Material SA-516 Gr. 55  
(Spec. No., Grade) (Spec. No., Grade)

Location (Top, Bottom, Ends)	Min. Thk.	Corr. Allow.	Crown Radius	Knuckle Radius	Ellipse Ratio	Conical Apex Angle	Hemisp. Radius	Flat Diam.	Side to Pressure (Convex or Concave)
(a) <u>Top</u>	<u>500</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>2:1</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>Concave</u>
(b) <u>Bottom</u>	<u>500</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>2:1</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>Concave</u>

If removable, bolts used (describe other fastenings) n/a

9. Constructed for max. allowable working pressure 200 psi at max. temp. 250 F. Min. temp. (when less than -20 F) (-)400 F. Hydrostatic test pressure 400 psi.  
(Material, Spec. No., Gr. Size, No.)  
10. Safety Valve Outlets: Number n/a Size n/a Location n/a

11. Nozzles and Inspection Openings.

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Matl.	Nom. Thk.	Reinforcement Matl.	How Attached	Location
<u>Inlet</u>	<u>1</u>	<u>1"</u>	<u>Forged</u>	<u>SA-105</u>	<u>6000#</u>	<u>n/a</u>	<u>Welded</u>	<u>Head</u>
<u>Outlet</u>	<u>1</u>	<u>1"</u>	<u>Forged</u>	<u>SA-105</u>	<u>6000#</u>	<u>n/a</u>	<u>Welded</u>	<u>Head</u>
<u>xxx</u>								
<u>xxx</u>								
<u>xxx</u>								
<u>xxx</u>								
<u>xxx</u>								

12. Supports: Skin yes Lugs no Legs no Other none Attached Welded to heads  
(Yes or no) (No.) (No.) (Describe) (Where and how)

13. Remarks: Model "30B" vessel for shipping UF6 per ANSI N14.1-1982.  
Head and shell materials meet impact requirements SA-20 and SA-370  
(-) 60 F. Hydro in vertical. For noncorrosive service. W.H. Stewart  
work order number 17827. Owner Serial Number: A-103 One (1)  
of ten (10) units per Edlow International Company letter, dated 4-18-83.

**CERTIFICATE OF COMPLIANCE**

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1.  
Date 7-5-83 Signed W. H. Stewart Co. by Lynn Cendergraft  
(Manufacturer) (Representative)

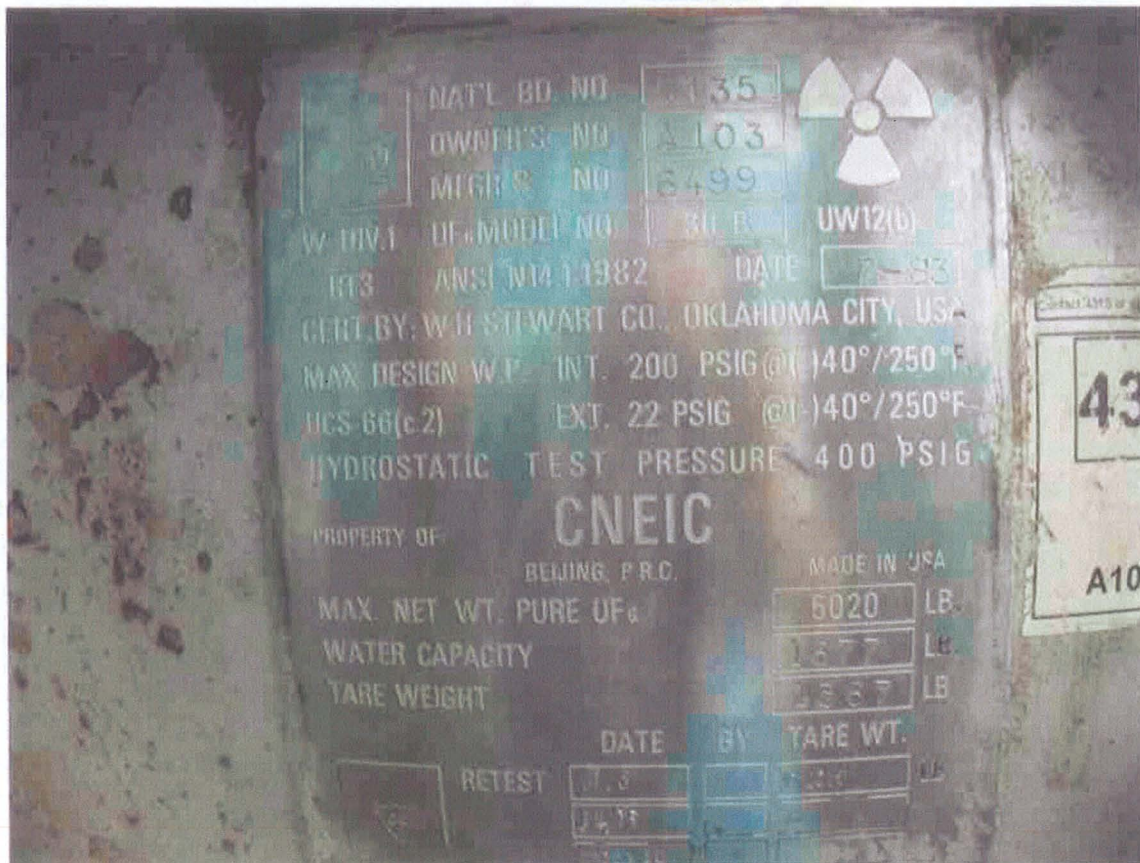
"U" Certificate of Authorization No. 4940 expires February, 1985

**CERTIFICATE OF SHOP INSPECTION**

Vessel made by W. H. Stewart Company at Oklahoma City, Oklahoma  
I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of Ark. and employed by Comm. Ins. Co. have inspected the pressure vessel described in this Manufacturers' Data Report on 7-5 19 83, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in the Manufacturers' Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Signed [Signature] Date 7-5-83 Commissions NB 7936  
(Inspector) (Nat'l Board, State, Province and No.)





**NAT'L BD# 5135**

**OWNER'S # A103**

**MFGR'S # 6499**

**Name plate.**

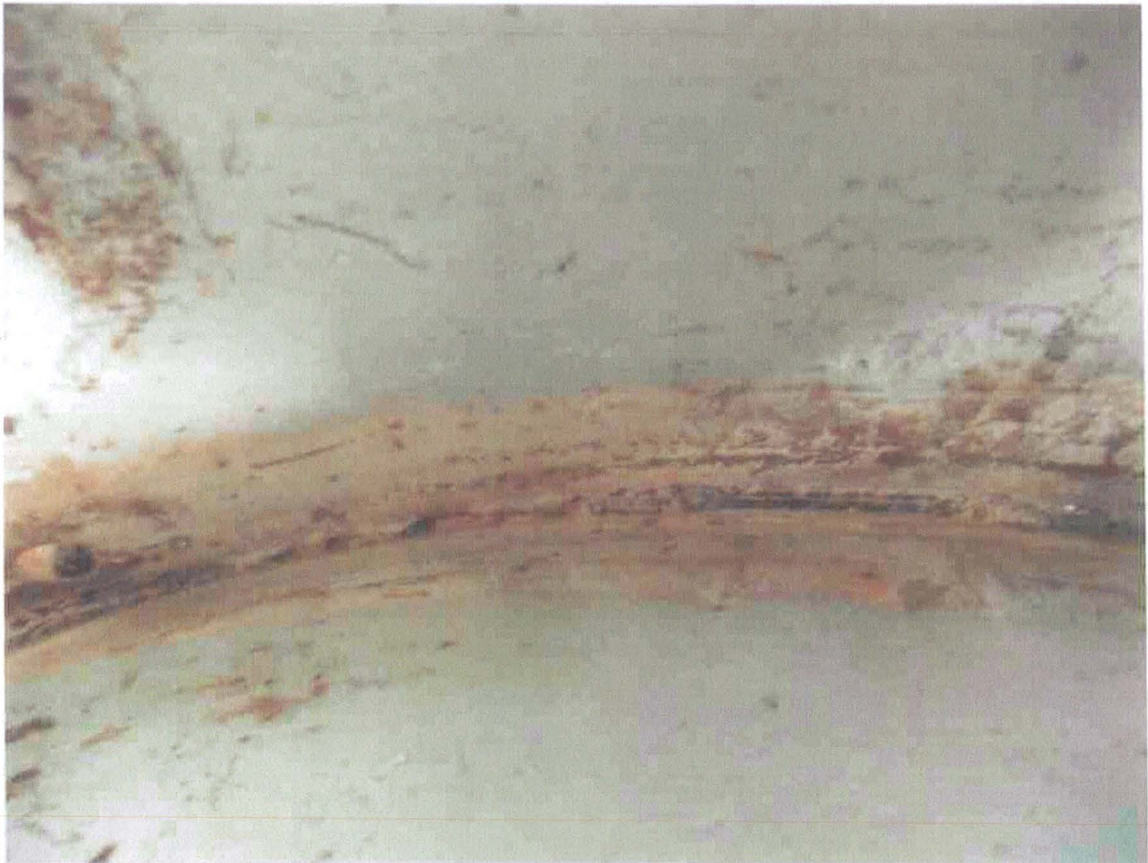


**NAT'L BD# 5135**

**OWNER'S # A103**

**MFGR'S # 6499**

Showing root of weld brought into question for nonstandard appearance.



**NAT'L BD# 5135**

**OWNER'S # A103**

**MFGR'S # 6499**

**Showing root of weld brought into question for nonstandard appearance.**





**NAT'L BD# 5135**

**OWNER'S # A103**

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**NAT'L BD# 5135**

**OWNER'S # A103**

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**Showing root of weld brought into question for nonstandard appearance.**



**NAT'L BD# 5135**

**OWNER'S # A103**

**MFGR'S # 6499**

**Showing root of weld brought into question for nonstandard appearance.**





**NAT'L BD# 5135**

**OWNER'S # A103**

**MFGR'S # 6499**

Face of weld and adjacent base metal, showing no signs of grinding, gouging, or turning marks.

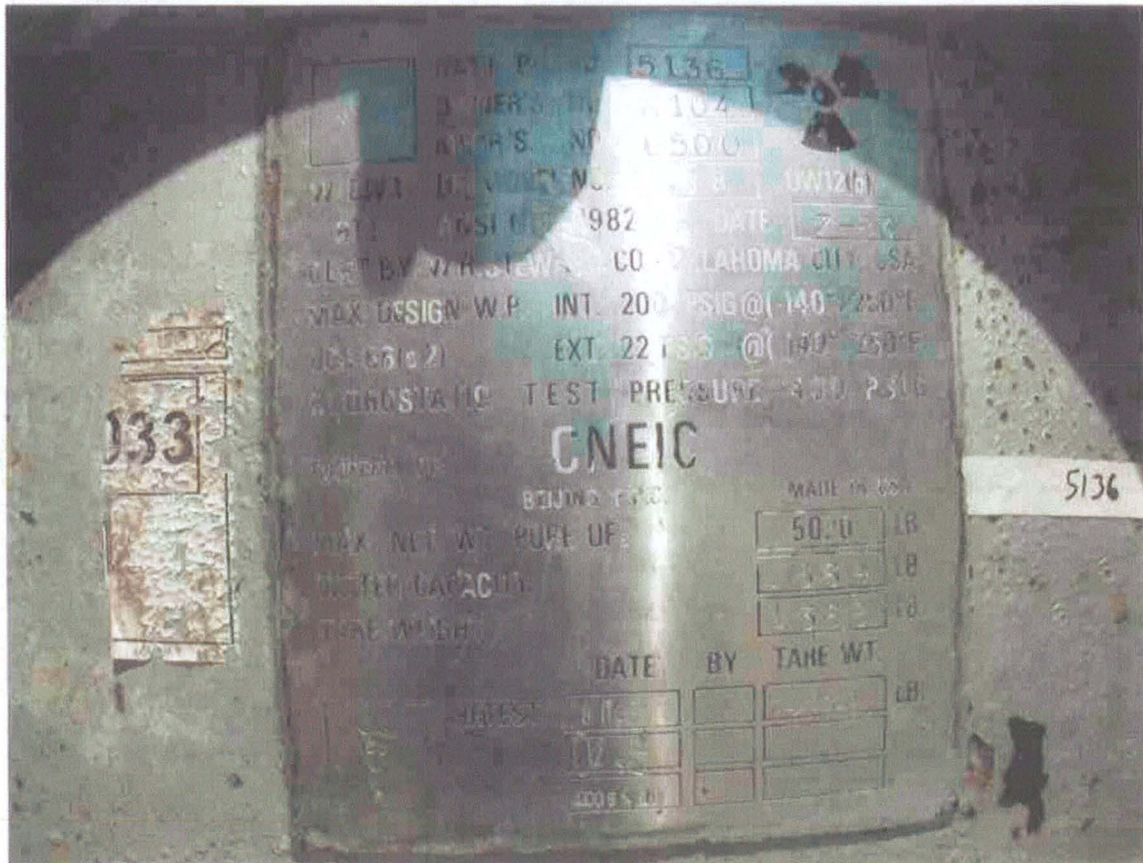


**NAT'L BD# 5135**

**OWNER'S # A103**

**MFGR'S # 6499**

**Face of weld and adjacent base metal, showing no signs of grinding, gouging, or turning marks.**



**NAT'L BD# 5136**

**OWNER'S # A104**

**MFGR'S # 6500**

**Name Plate**

**This Cylinder was used for evaluation to verify typical construction standards for this manufacture.**





**NAT'L BD# 5136**

**OWNER'S # A104**

**MFGR'S # 6500**

**Showing root of weld on cylinder with consecutive serial numbers to establish standard manufacturing appearance for this supplier.**



**NAT'L BD# 5136**

**OWNER'S # A104**

**MFGR'S # 6500**

Showing root of weld on cylinder with consecutive serial numbers to establish standard manufacturing appearance for this supplier.

# UF<sub>6</sub> CYLINDER INSPECTION DATA SHEET

CN-45

CYLINDER NUMBER <b>A-103</b>		CYLINDER MODEL <input type="checkbox"/> 30A (2 1/2-ton) <input type="checkbox"/> 48F (14-ton HW) <input type="checkbox"/> <input checked="" type="checkbox"/> 30B (2 1/2-ton) <input type="checkbox"/> 48Y (14-ton HW) <input type="checkbox"/> <input type="checkbox"/> 48A (10-ton) <input type="checkbox"/> 48G (14-ton LW) <input type="checkbox"/> <input type="checkbox"/> 48X (10-ton) <input type="checkbox"/> 48H (14-ton LW) <input type="checkbox"/>		<input type="checkbox"/> DATE SHIPPED <input checked="" type="checkbox"/> DATE RECEIVED WATER CAPACITY <b>1637 LBS</b> HYDROSTATIC PRESSURE TEST DATE OF _____ <input checked="" type="checkbox"/> IS ACCEPTABLE <input type="checkbox"/> IS NOT ACCEPTABLE CYLINDER'S CONTENTS ARE SOLIDIFIED <input type="checkbox"/> YES <input type="checkbox"/> NO	
Cylinder is Code Stamped <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO INCHES Hg _____		CYLINDER STATUS <input type="checkbox"/> FULL <input type="checkbox"/> EMPTY CYLINDER BEING INSPECTED: <input type="checkbox"/> PRIOR TO BEING SHIPPED <input checked="" type="checkbox"/> AFTER BEING RECEIVED <input type="checkbox"/> PRIOR TO BEING FILLED <input type="checkbox"/> PRIOR TO BEING TESTED			
CYLINDER IS OVERFILLED: <input type="checkbox"/> YES <input type="checkbox"/> NO		Net weight is _____ pounds. Maximum Allowable Fill Limit is _____ pounds.			
		CONDITION <input type="checkbox"/> Acceptable <input type="checkbox"/> Un-Acceptable <input type="checkbox"/> Not Applicable			
I. CYLINDER VALVE, VALVE PORT AND PLUGS	A. VALVE 1. Valve Type <b>DESCOTE</b>		<input checked="" type="checkbox"/>		
	2. Physical Damage _____		<input checked="" type="checkbox"/>		
	3. Thread Engagement _____ (Threads showing <b>5</b> )		<input checked="" type="checkbox"/>		
	4. Valve Cap - Present and in Place _____		<input checked="" type="checkbox"/>		
	B. VALVE PORT 1. Plugged with UF <sub>6</sub> _____				
	2. Contaminated with Other U-Salts or Foreign Material _____				
	C. PLUGS 1. Physical Damage _____		<input checked="" type="checkbox"/>		
	2. Thread Engagement _____ (Threads showing <b>4 1/2</b> )		<input checked="" type="checkbox"/>		
	3. Sealed _____				
	D. VALVE PROTECTOR: 1. Present and Properly Positioned _____				
2. Sealed _____					
Description of Damage (if any): _____					
II. CYLINDER WELDS	A. CIRCUMFERENTIAL HEAD SEAM WELD - VALVE END		<input checked="" type="checkbox"/>		
	B. CIRCUMFERENTIAL HEAD SEAM WELD - PLUG END		<input checked="" type="checkbox"/>		
	C. LONGITUDINAL SEAM WELD		<input checked="" type="checkbox"/>		
	D. LIFTING LUGS - WELD		<input checked="" type="checkbox"/>		
Description of Damage (if any): _____					
III. CYLINDER SHELL AND HEADS	A. SHELL		<input checked="" type="checkbox"/>		
	B. HEAD-VALVE END		<input checked="" type="checkbox"/>		
	C. HEAD-PLUG END		<input checked="" type="checkbox"/>		
	Description of Damage (if any): _____				
IV. STIFFENING RINGS	A. VALVE END		<input checked="" type="checkbox"/>		
	B. CENTER		<input checked="" type="checkbox"/>		
	C. PLUG END		<input checked="" type="checkbox"/>		
	Description of Damage (if any): _____				
V. SKIRTS	A. VALVE END		<input checked="" type="checkbox"/>		
	B. PLUG END		<input checked="" type="checkbox"/>		
Description of Damage (if any): _____					
DATE AND TIME INSPECTED <b>11:30 AM 4-16-12</b> INSPECTED BY <b>Robert Fisher Jr.</b>					
SECTION A	THIS SECTION TO BE COMPLETED BY QUALITY EVALUATION.				
	REMARKS _____				
	The above item(s) is <input type="checkbox"/> Acceptable <input type="checkbox"/> Unacceptable DATE _____ QUALIFIED INSPECTOR _____				
SECTION B	THIS SECTION TO BE COMPLETED WHEN THE DAMAGE INDICATED ABOVE IS EVALUATED BY OTHER THAN QUALITY EVALUATION PERSONNEL.				
	The following damage has been evaluated and disposition is: _____				
	APPROVED BY _____ TITLE _____ DATE _____				
UCN-8008 (S. 2-82) DISTRIBUTION White - Uranium Control (KYRC) Blue - Quality Evaluation (When Section A is completed) Buff - Originator					
CONDITION LEGEND: A - Acceptable B - Unacceptable NA - Not Applicable					

## Typical Cylinder Inspection Data Sheet

CYNO. **A-103**  
 National Board NO. **5135** (See attached Form U-1A)