STATEMENT OF WORK
FOR THE
B354 ABUSE CHAMBER SYSTEM FY07

CONTENTS

1.0 INTRODUCTION

NASA has a requirement for the manufacture and installation of a two 100Psi Vessels. These Vessels shall be used to perform different types of abuse testing on many different battery chemistries at the Energy Systems Test Area (ESTA) of the Johnson Space Center (JSC). This statement of work (SOW) sets forth the minimum requirements for these vessels.

2.0 ACRONYMS

ASME	American Society of Mechanical Engineers
CGA	Compressed Gas Association
ESTA	Energy Systems Test Area
JSC	Johnson Space Center
LN2	Liquid Nitrogen
MAWP	Maximum Allowable Working Pressure
NPS	National Pipe Size
NPT	National Pipe Thread
PSS	Pressure System Specialist
SOW	Statement of Work
PSMO	Pressure Systems Management Office

3.0 APPICABLE SPECIFICATIONS AND STANDARDS

ASME Boiler and Pressure Vessel Code, Section VIII, Division 1
ASME B16.5, Pipe Flanges and Flanged Fittings
JPR 1710.13D, Design, Inspection, and Certification of Pressure Vessels and Pressurized Systems

4.0 TASK DESCRIPTION

4.1 General Requirements

The contractor shall design, fabricate, certify and deliver the vessels as described in this statement of work. This vessel shall be designed, fabricated, inspected, and tested in accordance with the ASME Boiler and Pressure Vessel Code, Section VIII, Division 1. These vessels shall also bear a U-stamped nameplate for both the inner and outer vessels.

4.2 Specific Requirements

The following features shall be incorporated into the vessel design.

Reference attached drawing.
MAWP, Inner Vessel: 100 psig, Full vacuum
MAWP, Outer Vessel: 100 psig
Design Temperature: -320°F to 500°F
Material: 304 series stainless steel inner vessel, outer vessel, and nozzles
Horizontal design:
- 24" Diameter
- 36" Length
- 1 - Front hinged door

Inner Vessel Ports Required:
- 1ea, 8" ASME B16.5 150# flange on center back
- 1ea, 8" ASME B16.5 150# flange with view port on center front of the door
- 1ea, 2" ASME B16.5 150# flange, drain port on bottom of vessel
- 6ea, 1" NPT ports on the back flange
- 1ea, 2" NPT Exhaust port in middle of rear flange of vessel
- 1ea, 1" NPT input purge port in upper front of vessel

Outer Vessel Ports Required:
- 2 ea, 1"NPT, (Top and bottom, at opposing ends)

Thermal Capabilities:
- Vessel shall require a thermal shroud.
- Pressure on thermal shroud 100psi

1ea, Lift Lugs: Rated for full Vessel
1ea, Vessel must contain feet which shall be 11" from lowest point of Vessel
Feet shall be 25" away from each other in length.

4.3 Inspection

Upon delivery, a visual inspection shall be performed by the building 354 personnel. These Vessels shall also receive an internal and external inspection by a JSC PSS in accordance with JPR 1710.13 before final acceptance.

5.0 DELIVERABLES

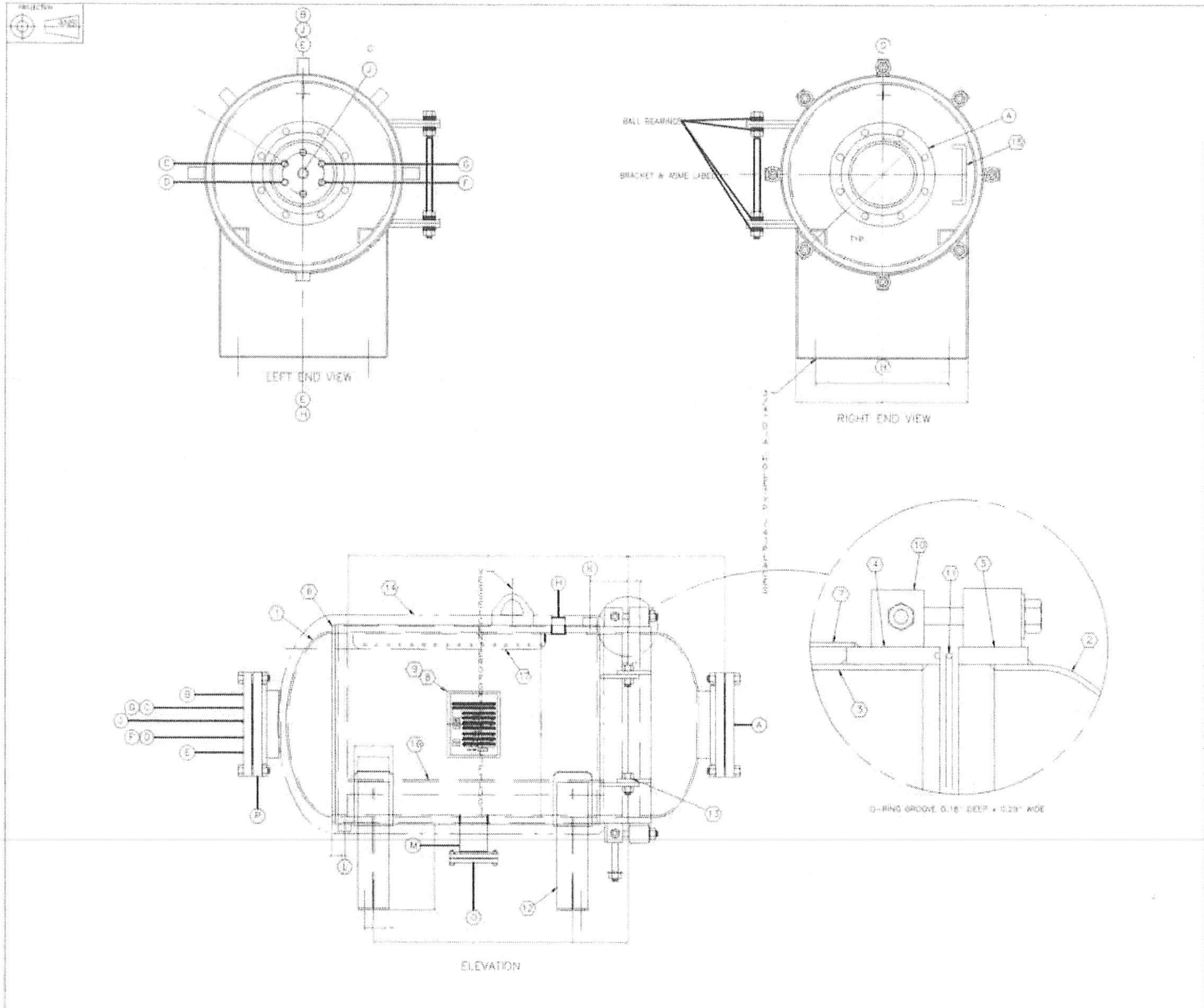
5.1 Initial Drawings

Initial drawings shall be submitted to NASA for approval within 2 weeks after the award of the subcontract.

5.2 Final Deliverables

The following shall be delivered to NASA within 8 weeks after approval of the drawing package:

2 Vessels (B354 Abuse Chamber System) in accordance with Section 4.0
Final hard copy of the as-built drawing package(s)
Electronic PDF copy of the as-built drawing package(s)
Copy of the data reports in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, UG-120
Copy of each Weld Procedure Specification used during fabrication
Copy of each Procedure Qualification Record used during fabrication
Copy of each Welder Performance Qualification used during fabrication



REV	DATE	DESCRIPTION
[illegible]	[illegible]	LENGTHENED [illegible] AND ADDED [illegible] HOLES
[illegible]	[illegible]	ADDED TRAY SUPPORTS AND CAMERA MOUNT, RESUBMITTED FOR APPROVAL

DESIGN DATA

ITEM	VESSEL MATERIAL	ALLOWABLE STRESS	TYPE	THICKNESS
1	VESSEL LEFT HEAD: SA-240-304	17,500	2:1	3/16"
2	VESSEL RIGHT HEAD: SA-240-304	17,500	2:1	3/16"
3	VESSEL SHELL: SA-240-316	18,000	PLATE	1/4"
4	BODY RING (SHELL): SA-240-304	17,500	BAR	3/4"x4"
5	BODY RING (HEAD): SA-240-304	17,500	BAR	3/4"x3"
6	JACKET CLOSURE BAR: SA-479-304	17,500	BAR	3/4" SQ
7	JACKET SHELL: SA-240-304	17,500	PLATE	3/16"
8	LABEL BRACKET - 3/16" THK. x 2" WIDE x [illegible] TALL W/ [illegible] (2) STYLE BRACKETS, SA-240-304			
9	ASME LABEL: SA-240-304			
10	(8) CLAMP ASSEMBLIES - 304 STAINLESS STEEL BOLTS, NUTS, LUGS, & CLEVIS			
11	GASKET - 6.5MM CORD BUNA-N (FOR HYDRO AND SHIPPING) (SERVICE GASKET SUPPLIED BY OTHERS)			
12	(2) SADDLES - 3/16" THK. SA-240-304			
13	HINGE - 304SS			
14	INSULATION BLANKET - 1" THK. "E" TYPE FIBERGLASS W/ SILICONE COATED FIBERGLASS FABRIC JACKET			
15	HANDLE - 304SS			
16	(3) TRAY SUPPORTS - 2"x2"x1/4" ANGLE 35" LONG SA-479-304			
17	CAMERA MOUNT - 3/16" THK. x 2" WIDE BAR [illegible] W/ (22) 1/8" DIA. HOLE 1.5" APART SA-240-304			

VESSEL TO BE BUILT & LABELED ACCORDING TO ASME CODE SECTION VIII, DIVISION 1, 2001 EDITION, 2003 ADDENDA: YES X NO __

	VESSEL	JACKET		
DESIGN PRESSURE (M.A.W.P.)	100 psig	100 psig	CODE STAMP	[illegible]
HYDRO TEST PRESSURE	150 psig	150 psig	CORR. ALLOW.	None
EXTERNAL PRESSURE	100 psig	N/A	X-RAY REQ'D	None
DESIGN TEMPERATURE	300° F	300° F	HEAT TREAT	None
MIN. DESIGN METAL TEMP.	[illegible]	[illegible]	CHARPY IMPACT	None

OTHER

INTERIOR: CLEANED - PLAIN MILL FINISH

EXTERIOR: CLEANED - PLAIN MILL FINISH

NOTES:
1. SUPPLY (1) 6" [illegible] STAR SIGHT WINDOW PART# [illegible] RATED FOR 100 PSIG AT [illegible] (PART CODE) SUPPLIED WITH BOLTING HARDWARE (304SS) AND (5) SPARE GASKETS [illegible]

ALL FLANGE BOLT HOLES TO STRADDLE NATURAL C/L OF VESSEL. VESSEL NOT DESIGNED FOR [illegible] PIPING. ALL FITTINGS AND FLANGE FACES TO BE PROTECTED WITH PLASTIC COVERS PRIOR TO SHIPMENT. TOLERANCES: [illegible]

CUSTOMER HAS THE RESPONSIBILITY TO VERIFY ALL DIMENSIONS ON THIS DRAWING.

VERTICAL AND HORIZONTAL TANKS WITH LEGS OR SADDLES MAY REQUIRE SHIMMING OR GROUTING DURING INSTALLATION.

DEBURR AND BREAK ALL SHARP EDGES.

GASKETS SUPPLIED BY OTHERS UNLESS SPECIFIED.

NOZZLES & CONNECTIONS

MARK	SIZE	RATING	TYPE	MATERIAL (FLG./NOZ.)	[illegible]	[illegible]	[illegible]	NOTES/SERVICE
A	8"	150#/SCH [illegible]	[illegible]	SA-182-304/SA-312-304	[illegible]	0°	---	WINDOW w/BLIND
B	1"	3000#/FNPT	H.CPLG.	SA-182-304	---	0°	---	
C	1"	3000#/FNPT	F.CPLG.	SA-182-304	---	0°	---	
D	1"	3000#/FNPT	F.CPLG.	SA-182-304	---	0°	---	
E	1"	3000#/FNPT	F.CPLG.	SA-182-304	---	0°	---	
F	1"	3000#/FNPT	F.CPLG.	SA-182-304	---	0°	---	
G	1"	3000#/FNPT	F.CPLG.	SA-182-304	---	0°	---	
H	1"	3000#/FNPT	F.CPLG.	SA-182-304	---	0°	---	PURGE IN PORT
J	1"	3000#/FNPT	H.CPLG.	SA-182-304	---	0°	---	EXHAUST PORT
K	1"	3000#/FNPT	H.CPLG.	SA-182-304	---	0°	---	JACKET OUTLET
L	1"	3000#/FNPT	H.CPLG.	SA-182-304	---	0°	---	JACKET INLET
M	2"	3000#/FNPT	H.CPLG.	SA-182-304	---	0°	---	DRAIN PORT
O	2"	150#/SCH	[illegible]	SA-182-304/SA-312-304				FLANGE
P	8"	150#/SCH	[illegible]	SA-182-304/SA-312-304				FLANGE

VESSEL DESCRIPTION:				TAG/PROJECT NO.:	
CUSTOMER:		P.O. #		QTY:	DATE:
SCALE: 1=1 PRINTED:	DR.	ENGINEERING	SALES	DRAWING #	REV.