71-9511

Department of Energy
Washington, DC 20585

AUG 26 1994

Mr. Cass R. Chappell
Chief, Cask Certification Section
Storage and Transport Systems Branch
Division of Industrial and Medical
Nuclear Safety, NMSS
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Chappell:

Enclosed are 7 sets of the page changes constituting Revision 5 of the Safety Analysis Report for Packaging for the BUSS cask, Certificate USA/9511/B(U). These page changes address the questions raised in your letter dated June 17, 1994.

If you have questions or comments, please contact Ashok Kapoor at 301-903-6838 or Bob Towell at 301-601-9006.

Sincerely,

Ashok Kapoor
for

Michael E. Wangler
Director
Transportation and Packaging
Safety Division, EH-332

Enclosure

Ltr. Encl.
Change: LA 1 0
NTD1

SAND83-0698
TTC-0430

BENEFICIAL USES SHIPPING SYSTEM (BUSS) CASK SAFETY ANALYSIS REPORT FOR PACKAGING (SARP)*

VOLUME I

Sandia National Laboratories**
Albuquerque, New Mexico 87185

July 1994

* This work performed at Sandia National Laboratories, Albuquerque, New Mexico, supported by the United States Department of Energy under Contract DE-AC04-94AL85000.

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SARP Page and Revision Number

Page	Revision	Page	Revision	Page	Revision	Page	Revision
Title	5	1A-10	1	2A-7	1	2C-9	1
SARP Pg. &		1A-11	1	2A-8	1	2C-10	1
Rev. Number	5	1A-12	4	2A-9	1	2C-11	1
Abstract	1	1A-13	4	2A-10	1	2C-12	1
Ed. & Contr.	4	1A-14	4	2A-11	1	2C-13	1
I-1	4	1A-15	4	2A-12	1	2C-14	1
I-2	4	1A-16	1	2A-13	1	2C-15	1
I-3	4	1A-17	1	2A-14	1	2C-16	1
I-4	4	1A-18	1	2A-15	1	2C-17	1
I-5	4	1A-19	4	2A-16	1	2C-18	1
I-6	4	1A-20	1	2A-17	1	2C-19	1
I-7	4	1A-21	1	2A-18	1	2C-20	1
I-8	4	2-1	2	2A-19	1	2C-21	1
I-9	4	2-2	1	2A-20	1	2C-22	1
I-10	4	2-3	1	2A-21	1	2C-23	1
I-11	4	2-4	1	2A-22	1	2C-24	1
I-12	4	2-5	1	2A-23	1	2C-25	1
I-13	4	2-6	1	2A-24	1	2C-26	1
I-14	4	2-7	1	2A-25	1	2C-27	1
I-15	4	2-8	4	2A-26	1	2C-28	1
I-16	4	2-9	1	2A-27	1	2C-29	1
I-17	4	2-10	4	2A-28	1	2C-30	1
I-18	4	2-11	4	2A-29	1	2C-31	1
I-19	4	2-12	1	2A-30	1	2C-32	1
I-20	5	2-13	1	2A-31	1	2C-33	1
1-1	4	2-14	1	2A-32	1	2C-34	1
1-1A	4	2-15	1	2A-33	1	2C-35	1
1-2	4	2-16	1	2A-34	1	2C-36	1
1-3	1	2-17	1	2A-35	1	2C-37	1
1-4	1	2-18	1	2A-36	1	2C-38	1
1-5	4	2-19	1	2A-37	1	2C-39	1
1-6	2	2-20	4	2A-38	1	2C-40	1
1-7	1	2-21	1	2B-1	1	2C-41	1
1-8	1	2-22	1	2B-2	1	2D-1	1
1-9	1	2-23	1	2B-3	1	2D-2	1
1-10	1	2-24	1	2B-4	1	2D-3	1
1A-1	1	2-25	4	2B-5	1	2D-4	1
1A-2	3	2-26	1	2C-1	1	2D-5	1
1A-3	2	2-27	1	2C-2	1	2D-6	1
1A-4	1	2A-1	1	2C-3	1	2D-7	1
1A-5	1	2A-2	1	2C-4	1	2D-8	1
1A-6	1	2A-3	1	2C-5	1	2D-9	1
1A-7	1	2A-4	1	2C-6	1	2D-10	1
1A-8	1	2A-5	1	2C-7	1	2D-11	1
1A-9	4	2A-6	1	2C-8	1	2D-12	1

SARP Page and Revision Number (Continued)

Page	Revision	Page	Revision	Page	Revision	Page	Revision
5-12	1	9-7	4				
5-13	1	9-8	1				
5-14	1	9-9	1				
5-15	1	9-10	1				
5-16	1	9-11	1				
5-17	1	9-12	4				
5-18	1	9-13	1				
5-19	1	9-14	1				
5-20	1	9-15	1				
5-21	1	9-16	1				
5-22	1	9-17	1				
6-1	1	9A-1	1				
7-1	4	9A-2	1				
7-2	1	9A-3	1				
7-3	1	9B-1	1				
7-4	1	9C-1	1				
7-5	1						
7-6	1	Volume II					
7-7	1	Title	5				
7-8	1	II-1	1				
7-9	1	II-2	5				
7-10	5	S-1	4				
7-11	1	D-1	5				
7-12	1	D-2	5				
7-13	1	D-3	4				
7-14	4	D-4	4				
7-15	5	D-5	4				
7-16	5	D-6	4				
7-17	4	D-7	4				
7-18	1	D-8	4				
8-1	4	D-9	4				
8-2	2	D-10	5				
8-3	2						
8-4	1						
8-5	2						
8-6	1						
8-7	4						
8-8	4						
8-9	4						
8-10	2						
8-11	4						
9-1	1						
9-2	4						
9-3	1						
9-4	4						
9-5	4						
9-6	1						

Volume I

Revision 4, May 1993

Title Page

SARP Page and Revision Number pages i-iii

Editors and Contributors

I-1 through I-20

1-1, 1-1A, 1-2, 1-5, 1A-9, 1A-12 through 1A-15, 1A-19

2-8, 2-10, 2-11, 2-20, 2-25, 2G-1

3-12, 3C-3

4-5, 4-9

7-1, 7-10, 7-14 through 7-17

8-1, 8-7 through 8-9, 8-11

9-2, 9-4, 9-5, 9-7, 9-12

Revision 5, July 1994

Title Page

SARP Page and Revision Number pages i, iii

I-20

7-10, 7-15, 7-16

7. Before removing the basket, the basket guide fixture must be installed (shown in Figure 7.2.1-12). The hot-cell hoist is used to lift the basket out of the cask for loading (shown in Figure 7.2.1-13). If present, personnel should exit from the hot cell at this time. The basket is loaded remotely in the hot cell and then moved with the cell hoist back into the cask cavity. It is recommended that the lid be installed within one hour after basket installation in order to maintain the cask body and lid at similar temperatures. The basket guide fixture is removed and the cell hoist is next used to place the lid on the cask. Record the time that the lid is inserted (it should be less than one-hour after basket insertion). At this stage, personnel may reenter the hot cell to lower the lid using the jack-screws. If preferred, three bolts may be loosely installed in the lid and the cask may be removed from the hot cell without lowering the jackscrews. The cask should be lifted out of the hot cell by its trunnions as soon as reasonably possible for continued hands-on operations. When the lid is lowered, the indicator pins disappear, and the lid may then be bolted in place. Install the remaining lid bolts to hand tight. Before the lid bolts are torqued, the lid and cask body must be at approximately the same temperature. Measure the temperature of the lid and cask body with a surface thermometer. If the two measurements are within 40°F (22°C), proceed with lid bolt torquing. Tighten the bolts symmetrically first to a torque of 550 ft-lb (745 N·m) and then to a final torque of 1125 ft-lb (1525 N·m). If the temperature differential exceeds 40°F (22°C), allow the cask to come to thermal equilibrium before torquing the lid bolts.

8. The lower port plug on the cask is then again removed and a line is inserted into the lower port valve assembly (see Figure 7.2.1-15) that is valved first to a vacuum pump and second to a helium supply. A schematic is shown in Figure 7.2.1-14. Verify that the cask temperature is 50°F or above. If not, heat and maintain cask temperature above 50°F while vacuum drying. Using the vacuum pump, evacuate the cask cavity to a pressure of 5 torr or less. Using a calibrated vacuum gauge to verify the pressure in the cavity, valve off the vacuum pump and monitor the pressure for a period of 15 minutes. If the pressure rises greater than 2 torr, moisture is still present in the cask cavity and additional vacuum drying is required. If the pressure does not rise more than 2 torr, backfill the cask cavity with helium to a pressure of 1 atm. Disconnect the plumbing assembly from the port valve assembly. Perform assembly verification leakage tests as described in Chapter 8 (Section 8.1.4.3).

14. When the cask is ready to ship, affix personnel barrier to the shipping skid. With the exception of the tiedown turnbuckles attached to the cask trunnions, no attachments shall be made to the cask body, impact limiters or turnbuckles, hexagonal mounting pedestal or personnel barrier.

15. The cask system is now ready for labeling, placarding, and transport.

7.2.2 Loading the Cask Under Water

A few modifications in the above procedures are necessary when the cask is to be loaded under water. These changes include the following:

1. Instead of reattaching the lid and lower port plug after installing the new metallic seals in Step 5 of the previous section, these closures are kept off the cask. In addition, the upper port plug is removed, a new seal is installed and it is kept off the cask at this time. A quick disconnect fitting is installed in the lower port valve assembly so that water can enter the port (see Figure 7.2.1-15). The cask, without the closures but with the basket, basket guide, and lid guide pins, is lowered by its trunnions into the loading pool. Place the capsules into the basket in the cask cavity. If the capsules cannot be placed directly into the basket in the cask cavity, an overhead crane is used to remove the basket. The basket is loaded with capsules, and returned to the cask cavity. The basket guide is removed and the overhead crane is used to lower the cask lid onto the container.

2. Once the lid is positioned on the loaded cask, it is lifted to the pool surface by means of the trunnions and overhead crane. Once the head clears the water, several bolts are run-in hand-tight. The loaded cask is then lifted from the loading pool and is suspended briefly above the pool to drain.

3. After the cask has drained, it should be set down and allowed to dry for about 30 minutes. If the port plugs are left off the cask and the ports are vented to a monitored building exhaust system, the water vapor produced will be able to escape from the cask interior. The thermal output of the capsules will aid evaporation of entrapped moisture. As an option, air pressure may be used through one of the ports to quickly force the remaining moisture out of the cavity. The

lid can then be bolted closed as described in Step 7 of Section 7.2.1. The upper port plug is installed with the bolt torqued first to 30 ft-lb (41 N·m) and finally to 60 ft-lb (82 N·m). The quick disconnect fitting installed in the lower port valve assembly is removed and a line to the evacuation/backfill system (Figure 7.2.1-14) is installed in its place. Verify that the cask temperature is 50°F or above. If not, heat and maintain cask temperature above 50°F while vacuum drying. Using the vacuum pump, evacuate the cask cavity to a pressure of 5 torr or less. (Note: Depending on thermal output of the loaded capsules, a significant amount of moisture may still be present in the cask cavity, and pumping time may be as long as 2 hours to completely dry the cavity.) Valve off the vacuum pump and then monitor the cavity pressure as described in Step 8 of Section 7.2.1. The cavity is then backfilled with helium. The lid bolts are torqued and the lower port cover installed. All closure seals are then leak-checked as described in Section 8 (8.1.4.3).

Otherwise, the operational procedures for loading under water are identical to those for dry loading.

7.3 PROCEDURES FOR UNLOADING THE PACKAGE

Many of the procedures for unloading the BUSS cask are similar to the loading procedures. Some of the unloading procedures, however, are complicated by the relatively hot thermal state of the cask when it arrives for unloading. In particular, hands-on operations on the immediate surface of the cask will require some additional care. Upon receipt, a radiation survey of the cask should be completed.

The cask can also be unloaded under dry conditions in a hot cell. The procedures to be followed for each of these unloading conditions are described below. In each instance, it is assumed that the cask system arrives fully assembled at the unloading facility by truck.

7.3.1 Unloading the Cask Under Water

The following procedures are recommended for unloading the BUSS cask under water:

1. The cask is removed from the truck trailer as described in Step 1 of Section 7.2.1. Steps 2, 3, and 4 of that section are also performed. Care should be exercised in removing the impact limiters from the hot cask.

2. The cask is then lifted by its trunnions with an overhead crane off the cask handling frame and is lowered into the unloading pool. If the cask contains a high heat load, the container should remain underwater in the unloading pool for more than 24 hr. Cooling curves for the cask in water are provided in Appendix 3C.

3. The cask is lifted out of the unloading pool and rested on a level floor. The lower port plug is removed and a lead from a gas-sampling radiation detector or high-efficiency particulate air (HEPA) filter is attached to the port valve assembly. If no activity is detected from the gas-sampling radiation detector or measurement of the HEPA filter,

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BENEFICIAL USES SHIPPING SYSTEM (BUSS) CASK SAFETY ANALYSIS REPORT FOR PACKAGING (SARP)*

VOLUME II

Sandia National Laboratories**
Albuquerque, New Mexico 87185

July 1994

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Volume II

Revision 1, March 1989

II-1

S-1

D-1, D-3, D-5, D-6, D-7

Revision 2, April 1990

D-2, D-4

Revision 3, February 1991

Title Page

II-2

Revision 4, May 1993

Title Page

II-2

S-1

D-1 through D-10

Revision 5, July 1994

Title Page

II-2

D-1, D-2, D-10

NUMERICAL DRAWING
LIST OF BENEFICIAL USES
SHIPPING SYSTEM (BUSS) CASK
Structural Evaluation Section

DRAWING NO.	SIZE	TITLE	ISSUE
R44676	C	Bore Plug Assembly, Cask Body	A
R44381	D	Impact Limiter BUSS, Nonconformance	B
R44382	D	Upper Port, Unit I, Alternate Detail N	B
R43728	C	Bore Plug, Cask Body	A
S48921	D	Cover, Inner Cylinder, Impact Limiter (BUSS)	B
S48923	C	Lifting Support #2, Impact Limiter (BUSS)	B
S48924	C	Lifting Support #1, Impact Limiter (BUSS)	B
S48926	D	Housing Rod End Impact Limiter	B
S48927	B	Fill Cover, Impact Limiter (BUSS)	B
S48928	B	Fill Gasket, Impact Limiter (BUSS)	B
S48929	E	Impact Limiter BUSS	G
S48955	B	Guide Pin #1 Cask Body (BUSS)	C
S48956	B	Guide Pin #2 Cask Body (BUSS)	C
S48957	B	Guide Pin #3 Cask Body (BUSS)	C
S48958	B	Key, Cask Body (BUSS)	C
S48981	E	Cask Assembly	H
S48984	C	Turnbuckle, Impact Limiter	B
S50032	E	Cradle, Buss Cask	D
S50052	E	Basket, Cask Body 4 hole (BUSS)	F
S50053	E	Basket, Cask Body 6 hole (BUSS)	E
S50054	E	Basket, Cask Body 12 hole (BUSS)	D
S50055	E	Basket, Cask Body 16 hole (BUSS)	E
S50056	D	Basket Handle Assembly (BUSS)	B
S50057	E	Basket Assembly, 4 hole (BUSS)	C
S50058	E	Basket Assembly, 6 hole (BUSS)	C
S50059	E	Basket Assembly, 12 hole (BUSS)	C
S50060	E	Basket Assembly, 16 hole (BUSS)	D
S50061	C	Handle Guide Housing Basket (BUSS)	B
S50062	B	Handle Guide Basket (BUSS)	B
S50063	B	Pin, Basket (BUSS)	C
S50064	B	Compression Spring, Basket (BUSS)	C
S50065	C	Handle, Basket (BUSS)	C
S50066	C	Handle Bracket, Basket (BUSS)	B
S50980	A	304 S.S. Specification Cask Components (BUSS)	A
S51100	B	Guide Pin Nose, Cask Body (BUSS)	D
S51171	C	Trunnion Cask Body (BUSS)	D
S52562	C	Lid Lifting Assembly Cask Lid (BUSS)	C
S52563	C	Lifting Screw, Cask Lid (BUSS)	D
S52564	B	Lifting Screw Tip Cask Lid (BUSS)	C
S52565	B	Indicator Pin, Cask Lid (BUSS)	C
S52566	B	Spring Retainer, Cask Lid (BUSS)	C
S52606	E	Pallet	C
S52607	C	Mounting Block Assembly	B
S52608	D	Block Mounting	C
S52609	B	Ware Strip	B
S52614	E	Personnel Barrier - Lower	D
S52615	E	Personnel Barrier - Upper	D

DRAWING NO.	SIZE	TITLE	ISSUE
S52829	C	Capsule Support, 4&6 hole Basket (BUSS)	B
S52830	C	Capsule Support, 12&16 hole Basket (BUSS)	B
S53296	D	Cable Assembly	B
S53297	D	Housing Cable End	A
S53741	D	Plate, Cover Drain Plug	B
S53743	C	Cover, Drain Plug	B
S54757	D	Drain Plug Assembly, BUSS	B
S54758	D	Lid Assembly Buss Cask	A
S54773	E	Cask with Impact Limiters	B
S54774	E	Cask in Cradle	C
S55861	C	Port Valve Assembly	C
S55862	C	Adapter	B
S55863	C	Sleeve	B
S58901	C	Pin Cable	A
S58938	D	Tape Impact Limiter	B
S58940	C	Handle, Drain Plug	A
S58998	D	Plate, Cover Drain Plug (Front)	B
S66574	C	Bolt, Tension, 12 point, External Wrenching, Flanged	B
S66575	C	Insert, BUSS Cask	A
S68157	C	Washer, Trunnion, Cask Body (BUSS)	A
S69358	D	Impact Ring, BUSS Cask	A
S81352	C	Security Block	A
S81386	C	Eye Bolt (1/4)	A
S81387	C	Eye Bolt (1/2)	A
S84795	B	Retainer Washer	B
S85366	E	Yoke, Tiedown	B
S86213	C	Rod Eye, Tiedown	A
S86214	C	Rod End, Bearing, Turnbuckle	B
S86271	D	Turnbuckle, Tiedown	E
T73684	E	Body Cask 304 (BUSS)	N
T73685	D	Plug, Drain (BUSS)	E
T73689	E	Casting/Forging SSITS Cask	A
T73693	E	Cask Lid (BUSS) 304 SST	M
T83100	C	Cask Lid Forging	A
T83109	C	Lug, Lift (BUSS)	B
T99943	B	Retainer, Seal Drain Plug (BUSS)	B
T99944	C	Retainer, Seal Cask Lid (BUSS)	B
T99945	D	Seal, Helicoflex, Drain Plug (BUSS)	D
T99946	E	Seal, Helicoflex, Cask Lid (BUSS)	E

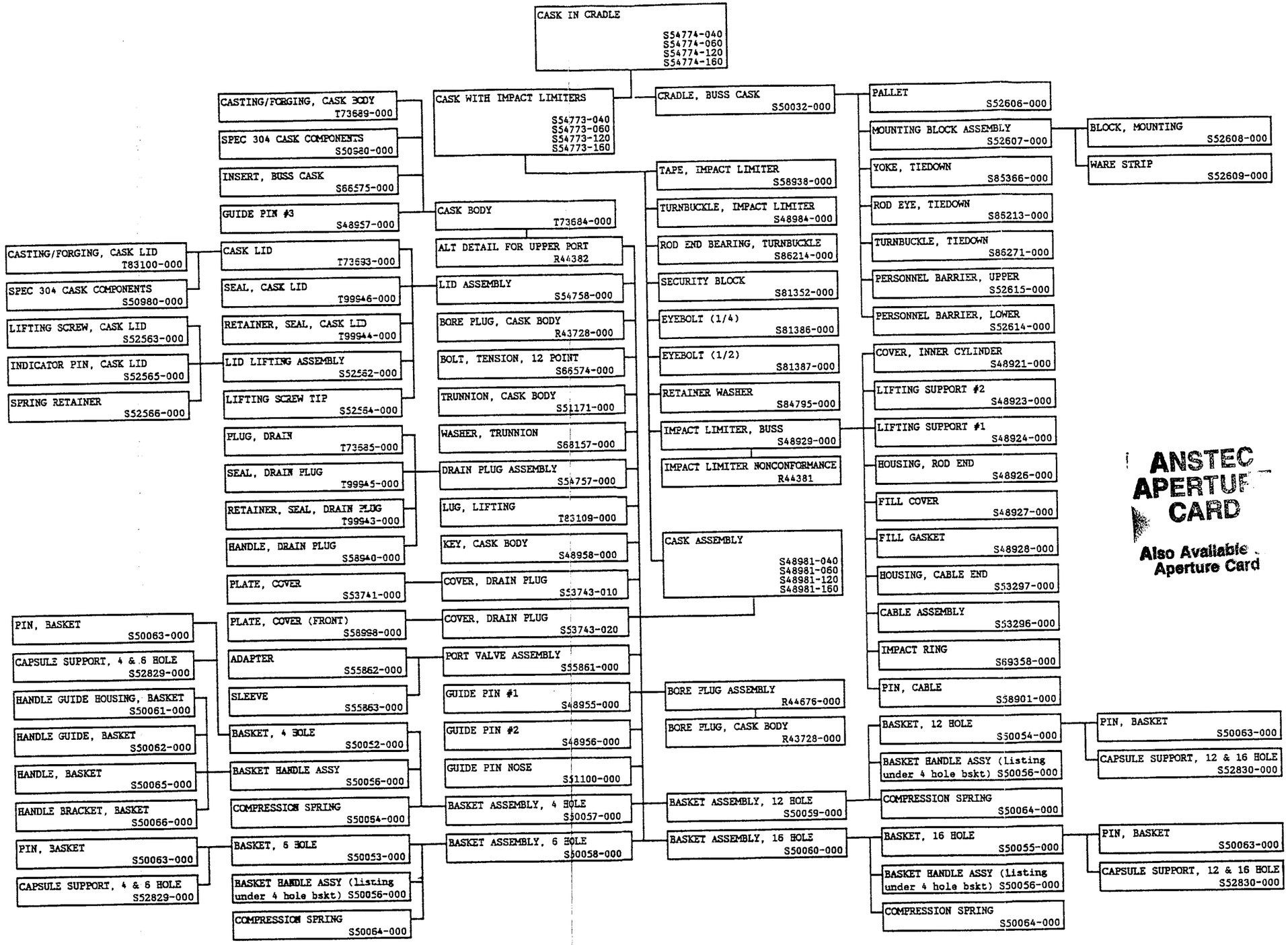

FIGURE WITHHELD UNDER 10 CFR 2.390

SHEET	1	2	3	4	5	6	TITLE: ALTERNATE DETAIL N FOR UPPER PORT OF UNIT 1, HEAT NO. 82V65-1-1 (U)
ISSUE	B						
PART CLASSIFICATION: UNCLASSIFIED							
DRAWING CLASSIFICATION: UNCLASSIFIED							SIZE: D; DRAWING NUMBER: R44382
							CAGEC 14213; SCALE 1/1; SHEET 1 OF 1
STATUS SA-REL-8-1-94							ORIGIN SA-AN5-V2.1

FIGURE WITHHELD UNDER 10 CFR 2.390