From: "Kendall, Thomas" <Thomas.Kendall@nmcco.com>
To: <PGK1@nrc.gov> Paul Krohn, RIII
Date: 11/12/02 1:44PM
Subject: Summary of SW header flush results

Paul,

The attached file contains information that I previously sent with the sample shipment to the PII labs. I've also added more details to give a feel of "how much" came out, and what it looked like. Not definitive, and not QA, but should be enough to provide the Agency a feel for where we are. I've also attached some photos of the flush in progress, equipment used, tank cleanliness after wash-down, etc. I've got 2 CDs full of photos if there is anything in particular you wish to see. Please call or e-mail me if I may be of further assistance.

Tom Kendall
(920)755-7661

<<Summary of flush results.doc>> <<DSC04309.JPG>> <<DSC04311.JPG>> <<DSC04354.JPG>> <<DSC04361.JPG>> <<DSC04366.JPG>> <<DSC04394.JPG>>

CC: "Flentje, Fritzie" <Fritzie.Flentje@nmcco.com>

A1336

Summary of SW Header Flush Results

Sediment samples were obtained by flushing the dead legs of Service Water headers leading to 2P-29 (11/7/2002) and 1P-29 (11/8/2002). The sediments and any debris in the dead legs were flushed into a 4,000 gallon polyethylene tank. The tank and connecting hoses, fittings, etc. had all been previously flushed with clean water to prevent contamination of the samples.

The tank contents were then gravity drained through a commercial dairy filter (unknown equivalent pore size, though an unused filter has been included in the shipment for comparison/evaluation) and then a 25 micron bag filter. Most of the sediments however, had to be scooped from the inside of the tank and filtered directly through a 25 micron filter. This filter proved to be so fine that it was difficult to completely dewater the samples. After as much filtration as practical, the remaining liquid was poured off into 1 liter sample bottles, and the loaded wet filters bagged & labeled.

A squeegee was used to gather the remaining sediments from the tank to the greatest extent possible, and the tank was hosed out repeatedly through the dairy filter assembly. When the dairy filter was too loaded to proceed, it was removed, bagged, labeled, and the cartridge assembly that held the filter was rinsed with clean water through a 25 micron filter bag. This filter was also bagged & labeled. The remaining fines in the tank were judged to be inconsequential, and the sediments removed are representative of the entire contents flushed. It is estimated that less than 5% of the total sediment inventory remained in the tank or were otherwise not recovered due to spillage while decanting, rinsing filters, etc. Care was taken to ensure that coarser materials were also captured (since the hosing and rinsing processes inevitably classified the sediments). These are concentrated in bottle #7 for the 2P-29 flush, and bottle #47 for the 1P-29 flush.

While setting up to flush the SW header, a drain valve had to be opened to empty piping prior to hooking up the flush hose. To prevent loss of potentially important material, a filter bag (Items #25 and #60) were used to filter the effluent from this drain valve (~2 gallons). They were also bagged and labeled. These bags appear to contain coarser corrosion products and may be of interest.

Approximately 1800 gallons were flushed from each header, and the water ran clear after ~2 minutes. Flushing continued for several minutes at a flow rate of 250-280 gpm for each flush. This was the maximum flow rate that could be achieved, and the corresponding pipe velocities will be considered when evaluating whether sufficient velocity was obtained to scour and entrain all sediments that may have been present in the piping.

Cursory inspection of the materials collected found that, with the exception of a small quantity of very small zebra mussel shells (~1/8") co-mingled with the silt in the previously mentioned "coarse" bottles, the sediment appeared to be a uniform and exceedingly fine clay / silt. Nothing of granular texture was noted (i.e. sand), although it may have been present in small quantities and occluded by the silt.

The absence of sand would be consistent with transport analyses that predict any round or granular particles excepting very fine silt should settle out of the intake flow stream before reaching the suction of the SW pumps. The zebra mussel shells have a much higher drag coefficient than spherical/granular structures, and may have been remained suspended in the intake flow stream.

The following pages contain a detailed inventory / shipping list of the samples sent to the laboratory for further evaluation. In all, the shipment weighed ~100 lbs. However, none of the samples had been dried, and it is estimated that ~95% of the weight can be attributed to water.

Box #	Item #	Descrip.	Comments
1	1	1 L poly bottle	Sediment from tank bottom; 2P-29
1	2	1 L poly bottle	Sediment from tank bottom; 2P-29
1	3	1 L poly bottle	Sediment from tank bottom; 2P-29
1	4	1 L poly bottle	Sediment from tank bottom; 2P-29
1	5	1 L poly bottle	Sediment from tank bottom; 2P-29
2	6	1 L poly bottle	Sediment from tank bottom; 2P-29
2	7	1 L poly bottle	Larger debris from tank bottom; 2P-29
2	8	25 micron fltr	Secondary fltr after dairy filter; 2P-29
1	9	25 micron fltr	Fines from tank bottom; 2P-29
1	10	25 micron fltr	Fines from tank bottom; 2P-29
1	11	25 micron fltr	Fines from tank bottom; 2P-29
1	12	25 micron fltr	Fines from tank bottom; 2P-29
1	13	25 micron fltr	Fines from tank bottom; 2P-29
1	14	25 micron fltr	Fines from tank bottom; 2P-29
1	15	25 micron fltr	Fines from tank bottom; 2P-29
1	16	25 micron fltr	Dairy filter cartridge rinsings; 2P-29
1	17	25 micron fltr	Fines from tank bottom; 2P-29
1	18	25 micron fltr	Secondary fltr after dairy filter; 2P-29
1	19	25 micron fltr	Fines from tank bottom; 2P-29
1	20	25 micron fltr	Fines from tank bottom; 2P-29
2	21	25 micron fltr	Fines from tank bottom; 2P-29
2	22	25 micron fltr	Secondary fltr after dairy filter; 2P-29
2	23	Dairy filter	Primary fltr for tank draining (1 of 2) ; 2P-29
2	24	Dairy filter	Primary fltr for tank draining (2 of 2) ; 2P-29
2	25	400 micron fltr	System drain through 2AF-63A; 2P-29
2	26	500 ml poly btl	Rinsings from backflush of RO-4015
2	27	400 micron fltr	Rinsings from backflush of RO-4015
2	28	Lrg poly bag	Transfer bag for RO-4015; contains debris
2	29	400 micron fltr	Rinsings from backflush of RO-4015
2	30	Sml manila envl.	Unused dairy filter
2	31	25 micron fltr	Dairy filter cartridge rinsings; 1P-29
2	32	1 L poly bottle	Sediment from tank bottom; 1P-29
2	33	1 L poly bottle	Sediment from tank bottom; 1P-29
2	34	1 L poly bottle	Sediment from tank bottom; 1P-29
2	35	1 L poly bottle	Sediment from tank bottom; 1P-29
2	36	25 micron fltr	Fines from tank bottom; 1P-29
2	37	25 micron fltr	Fines from tank bottom; 1P-29
2	38	25 micron fltr	Fines from tank bottom; 1P-29
2	39	25 micron fltr	Fines from tank bottom; 1P-29
2	40	25 micron fltr	Fines from tank bottom; 1P-29
2	41	25 micron fltr	Fines from tank bottom; 1P-29
2	42	25 micron fltr	Fines from tank bottom; 1P-29
3	43	1 L poly bottle	Larger Debris from tank bottom; 1P-29

3	44	1 L poly bottle	Sediment from tank bottom; 1P-29
3	45	1 L poly bottle	Sediment from tank bottom; 1P-29
3	46	25 micron fltr	Fines from tank bottom; 1P-29
3	47	25 micron fltr	Fines & some shells from tank bottom; 1P-29
3	48	25 micron fltr	Fines from tank bottom; 1P-29
3	49	25 micron fltr	Fines from tank bottom; 1P-29
3	50	25 micron fltr	Fines from tank bottom; 1P-29
3	51	Dairy fltr	Fines from draining tank; 1P-29 (1 of 6)
3	52	Dairy fltr	Fines from draining tank; 1P-29 (2 of 6)
3	53	Dairy fltr	Fines from draining tank; 1P-29 (3 of 6)
3	54	Dairy fltr	Fines from draining tank; 1P-29 (4 of 6)
3	55	Dairy fltr	Fines from draining tank; 1P-29 (5 of 6)
3	56	Dairy fltr	Fines from draining tank; 1P-29 (6 of 6)
3	57	25 micron fltr	Fines from final equipment rinse; 1P-29
3	58	25 micron fltr	Fines from final equipment rinse; 1P-29
3	59	25 micron fltr	Fines from final equipment rinse; 1P-29
3	60	25 micron fltr	Secondary fltr at discharge of dairy fltr; 1P-29
3	61	25 micron fltr	Rinsing fines; 1P-29
3	62	25 micron fltr	Rinsing fines; 1P-29
3	63	25 micron fltr	System drain through 2AF-63A; 1P-29
3	64	500 ml btl	Floor "scum" from 24B CST inspection
3	65	500 ml btl	Unknown debris from 24B CST inspection
3	66	500 ml btl	Paint chips from manway; 24B CST inspection
3	67	500 ml btl	Fines from sample point nozzle; 24B CST inspection
3	68	125 ml btl	Fines from 24B CST inspection
3	69	400 micron fltr	Fltr on 24B CST for draining
3	70	400 micron fltr	Fltr on 24B CST for draining
3	71	400 micron fltr	Fltr on 24B CST drain during washdown
3	72	400 micron fltr	Fltr on 24B CST for draining
3	73	Sml poly bag	Flakes from 24B CST inspection
3	74	Sml poly bag	Flakes from 24B CST inspection
3	75	Sml poly bag	Flakes from 24B CST inspection
3	76	25 micron fltr	Clean filter for comparison / evaluation
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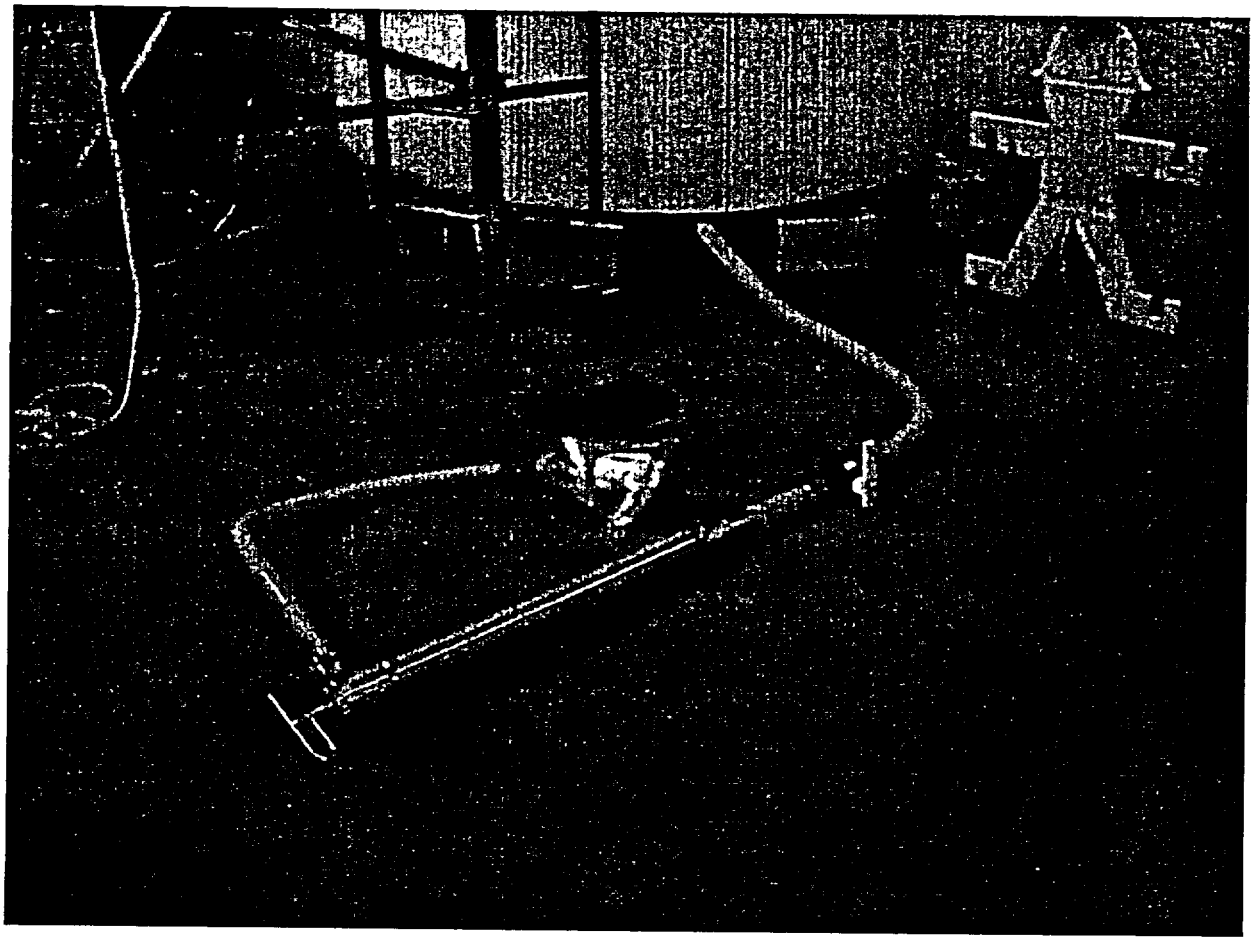

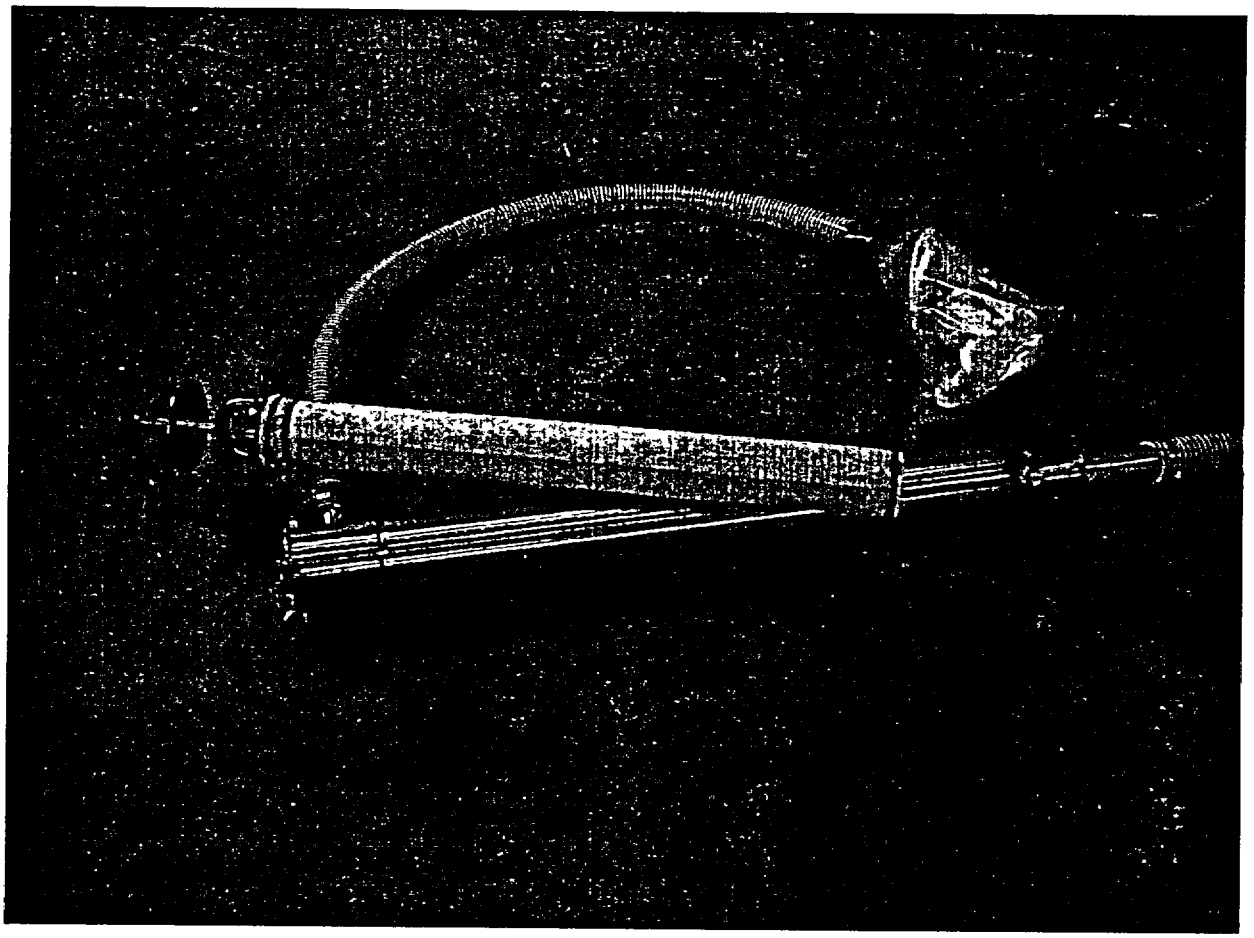

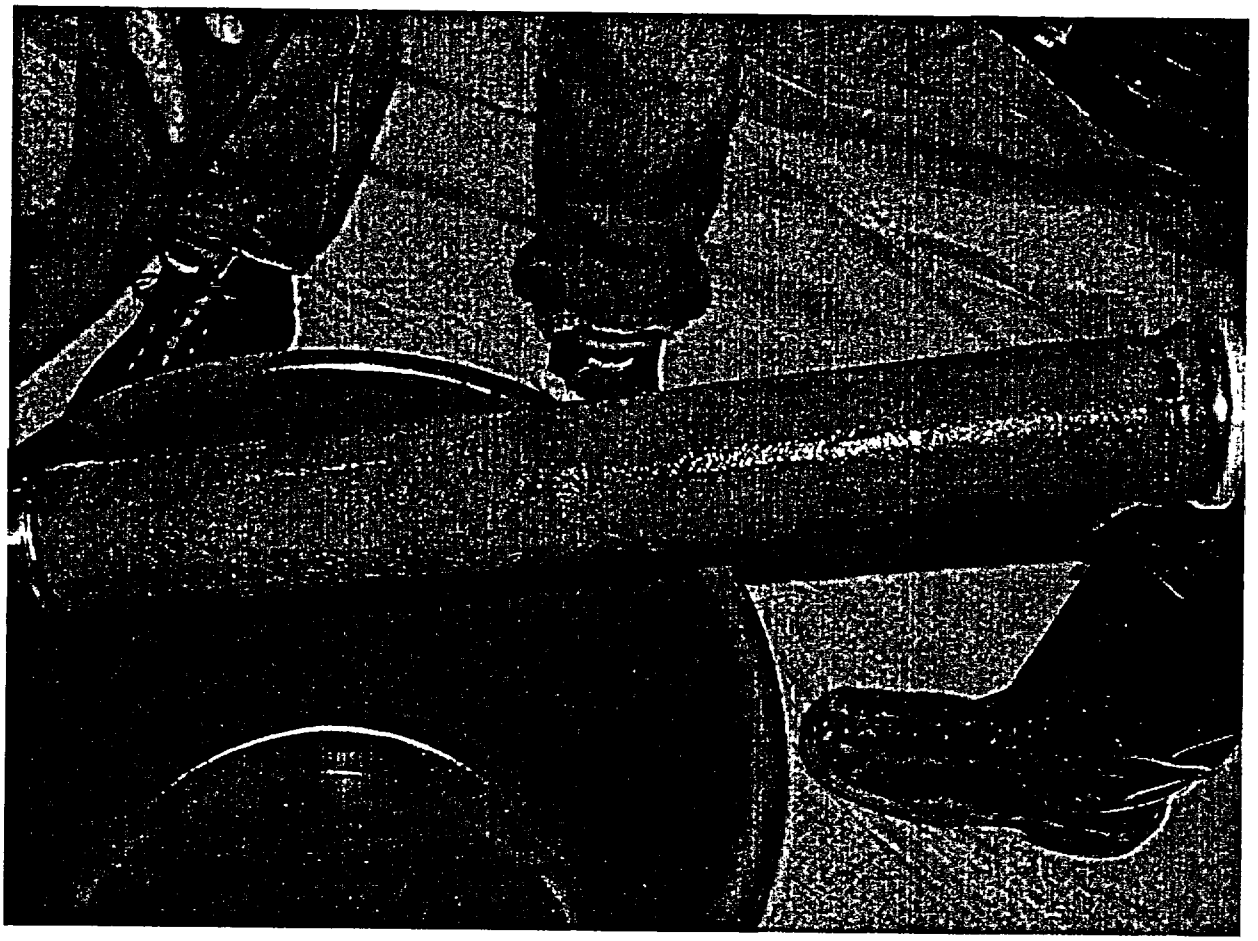

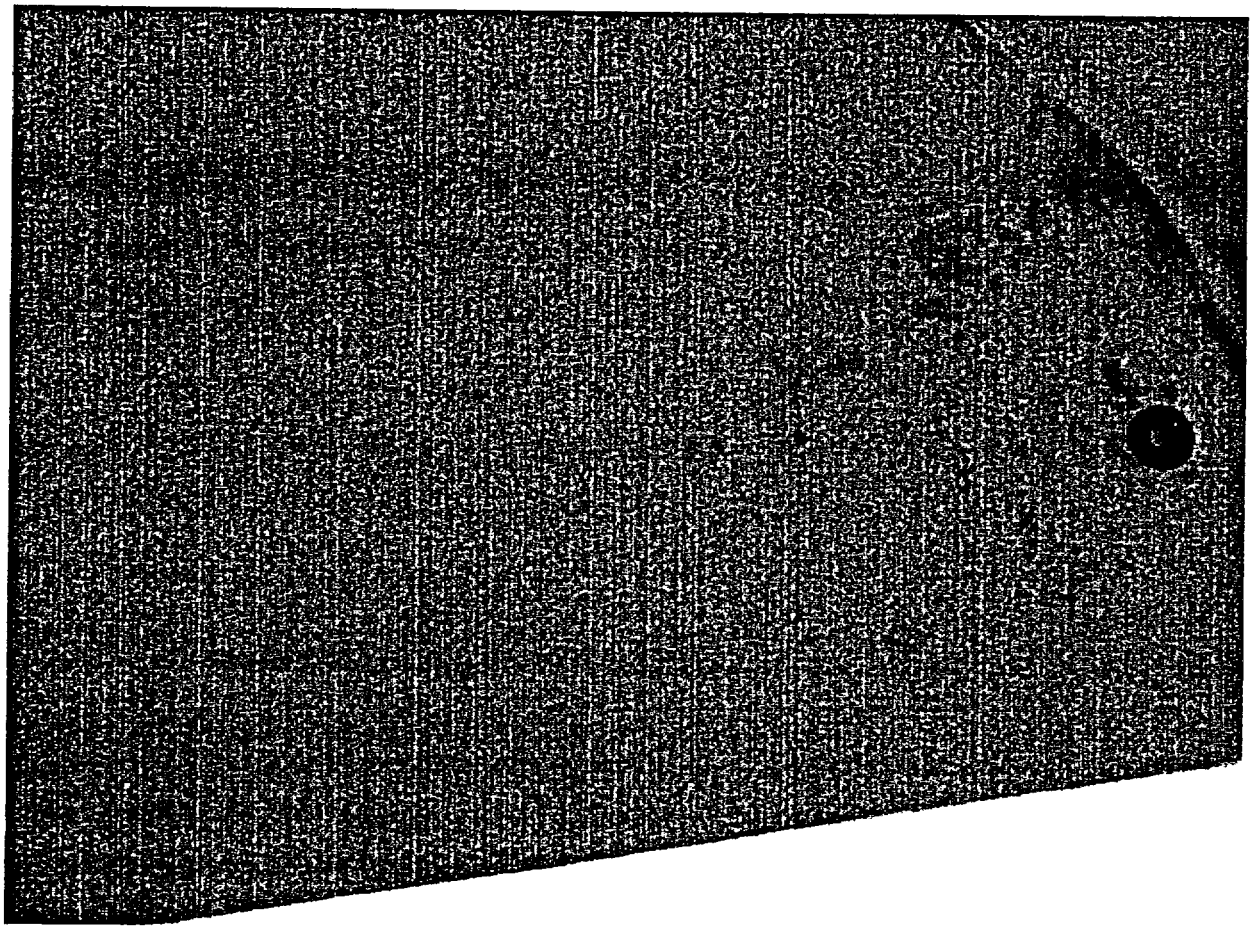

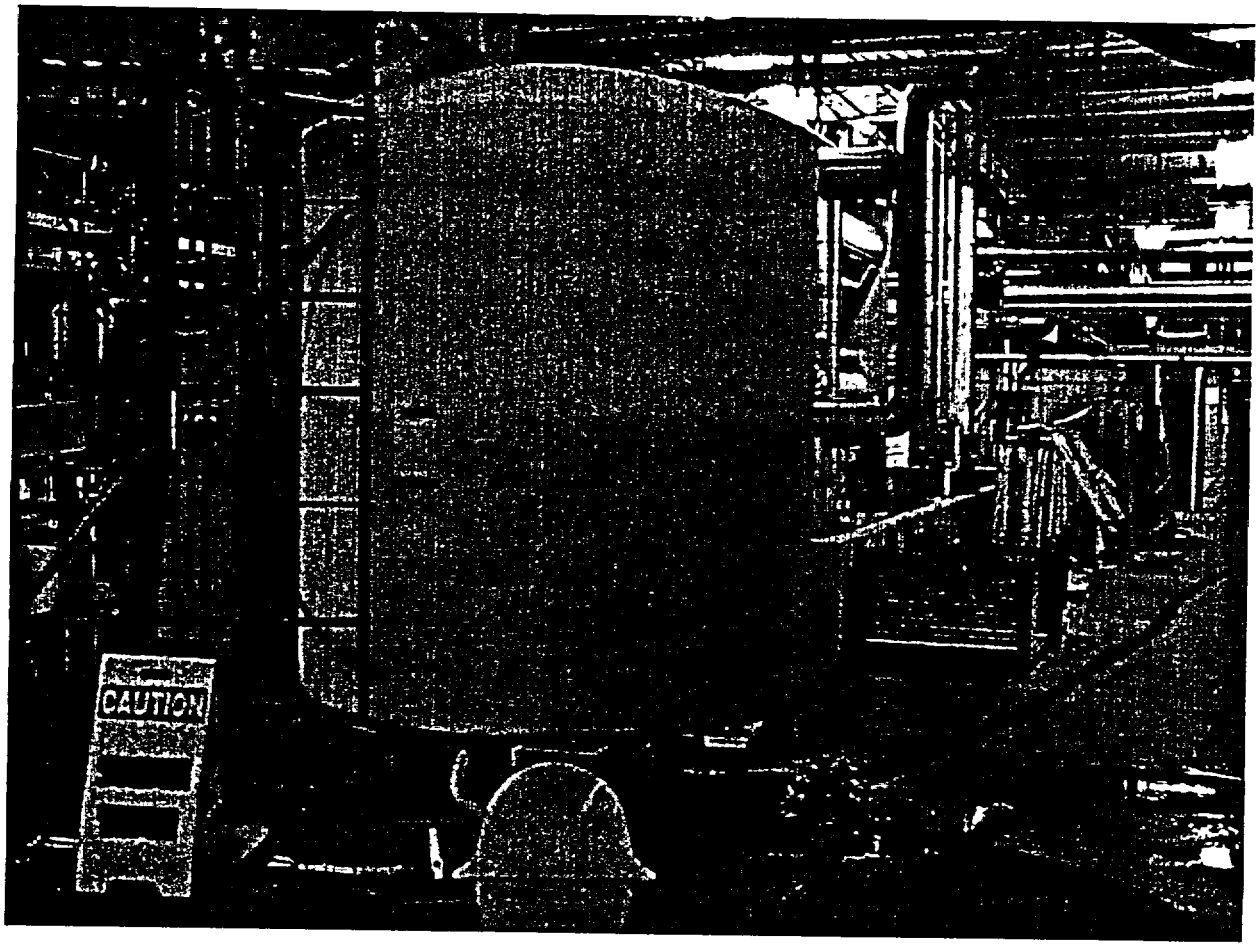
CAUTION