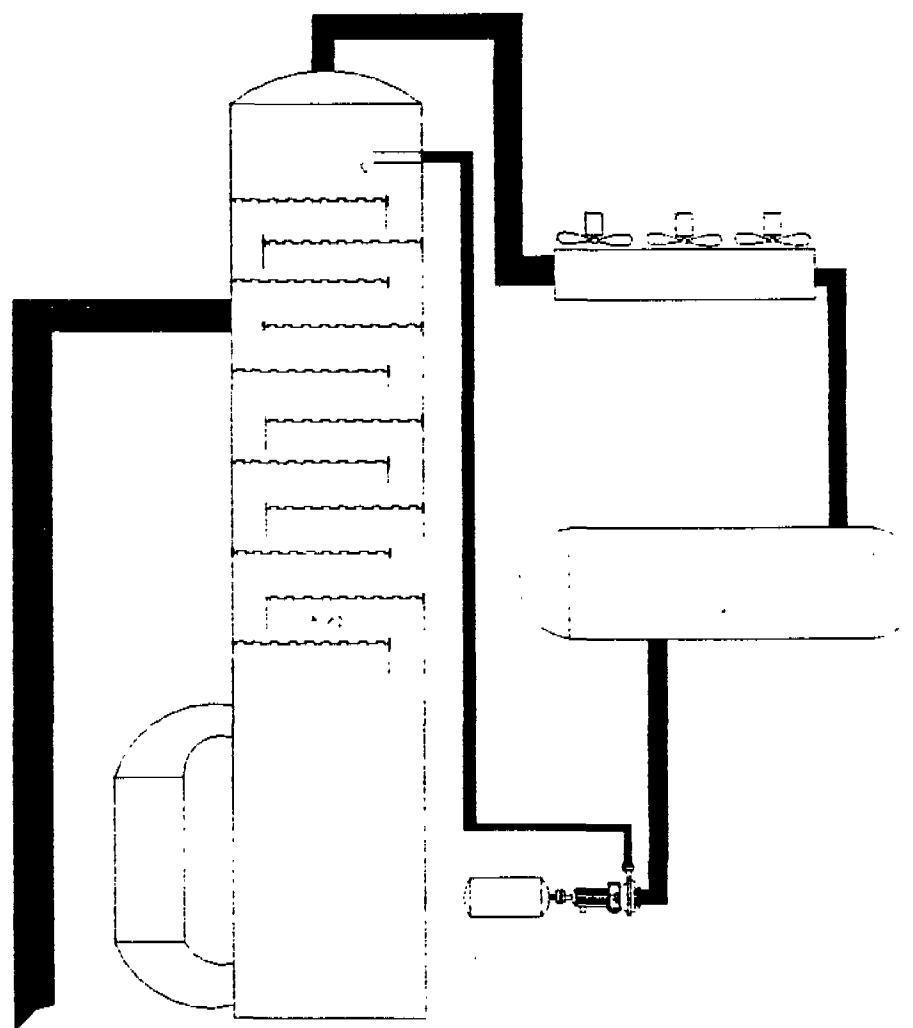


C-1530

DISTILLATION

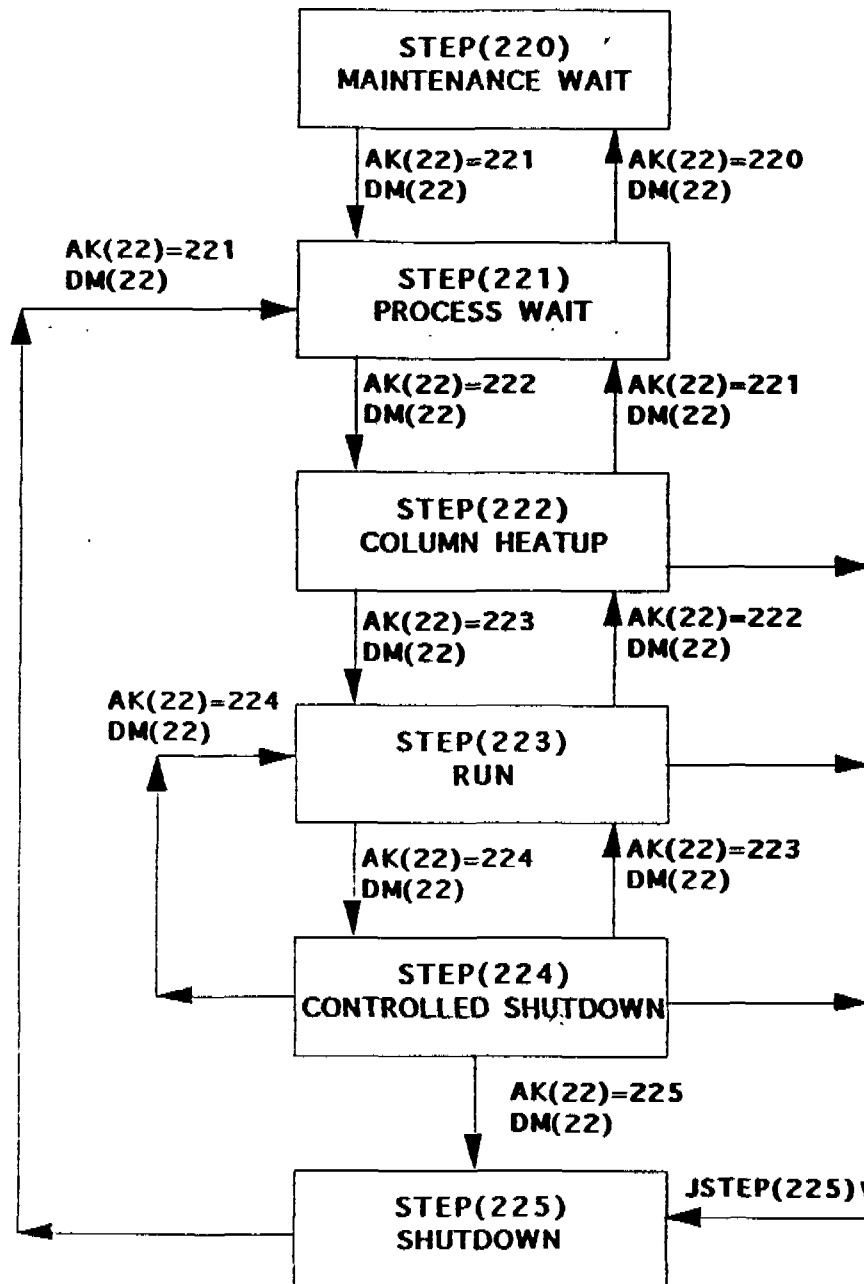
MODULE



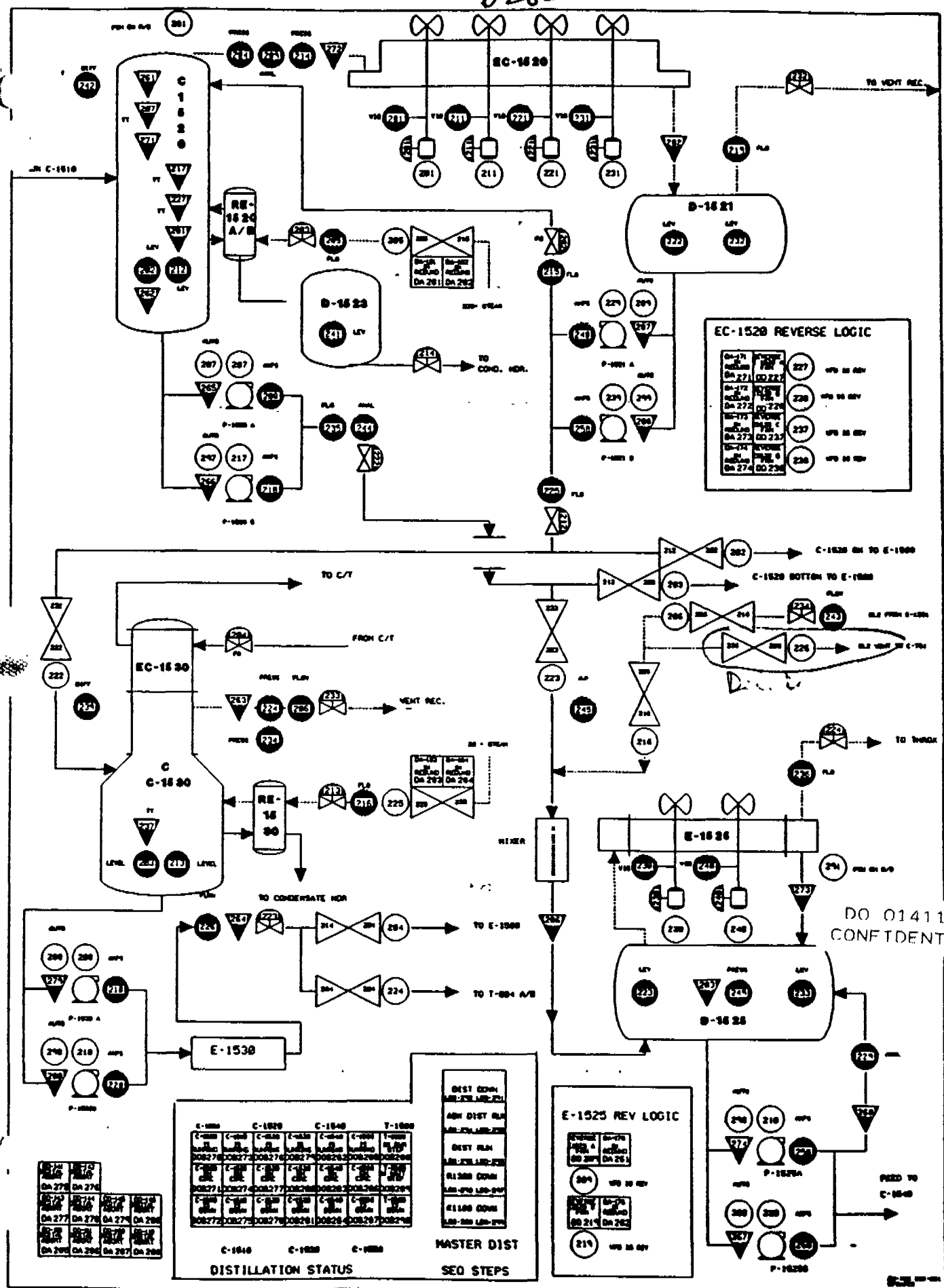
DO 014110
CONFIDENTIAL

CAN D200 SEQUENCE (22)

C-1530



0200



EC-1520 REVERSE LOGIC

DA-171	DA-172	DA-173	DA-174	DA-175	DA-176	DA-177	DA-178	DA-179	DA-180	DA-181	DA-182	DA-183	DA-184	DA-185	DA-186	DA-187	DA-188	DA-189	DA-190	DA-191	DA-192	DA-193	DA-194	DA-195	DA-196	DA-197	DA-198	DA-199	DA-200	DA-201	DA-202	DA-203	DA-204	DA-205	DA-206	DA-207	DA-208	DA-209	DA-210	DA-211	DA-212	DA-213	DA-214	DA-215	DA-216	DA-217	DA-218	DA-219	DA-220	DA-221	DA-222	DA-223	DA-224	DA-225	DA-226	DA-227	DA-228	DA-229	DA-230	DA-231	DA-232	DA-233	DA-234	DA-235	DA-236	DA-237	DA-238	DA-239	DA-240	DA-241	DA-242	DA-243	DA-244	DA-245	DA-246	DA-247	DA-248	DA-249	DA-250	DA-251	DA-252	DA-253	DA-254	DA-255	DA-256	DA-257	DA-258	DA-259	DA-260	DA-261	DA-262	DA-263	DA-264	DA-265	DA-266	DA-267	DA-268	DA-269	DA-270	DA-271	DA-272	DA-273	DA-274	DA-275	DA-276	DA-277	DA-278	DA-279	DA-280	DA-281	DA-282	DA-283	DA-284	DA-285	DA-286	DA-287	DA-288	DA-289	DA-290	DA-291	DA-292	DA-293	DA-294	DA-295	DA-296	DA-297	DA-298	DA-299	DA-300	DA-301	DA-302	DA-303	DA-304	DA-305	DA-306	DA-307	DA-308	DA-309	DA-310	DA-311	DA-312	DA-313	DA-314	DA-315	DA-316	DA-317	DA-318	DA-319	DA-320	DA-321	DA-322	DA-323	DA-324	DA-325	DA-326	DA-327	DA-328	DA-329	DA-330	DA-331	DA-332	DA-333	DA-334	DA-335	DA-336	DA-337	DA-338	DA-339	DA-340	DA-341	DA-342	DA-343	DA-344	DA-345	DA-346	DA-347	DA-348	DA-349	DA-350	DA-351	DA-352	DA-353	DA-354	DA-355	DA-356	DA-357	DA-358	DA-359	DA-360	DA-361	DA-362	DA-363	DA-364	DA-365	DA-366	DA-367	DA-368	DA-369	DA-370	DA-371	DA-372	DA-373	DA-374	DA-375	DA-376	DA-377	DA-378	DA-379	DA-380	DA-381	DA-382	DA-383	DA-384	DA-385	DA-386	DA-387	DA-388	DA-389	DA-390	DA-391	DA-392	DA-393	DA-394	DA-395	DA-396	DA-397	DA-398	DA-399	DA-400	DA-401	DA-402	DA-403	DA-404	DA-405	DA-406	DA-407	DA-408	DA-409	DA-410	DA-411	DA-412	DA-413	DA-414	DA-415	DA-416	DA-417	DA-418	DA-419	DA-420	DA-421	DA-422	DA-423	DA-424	DA-425	DA-426	DA-427	DA-428	DA-429	DA-430	DA-431	DA-432	DA-433	DA-434	DA-435	DA-436	DA-437	DA-438	DA-439	DA-440	DA-441	DA-442	DA-443	DA-444	DA-445	DA-446	DA-447	DA-448	DA-449	DA-450	DA-451	DA-452	DA-453	DA-454	DA-455	DA-456	DA-457	DA-458	DA-459	DA-460	DA-461	DA-462	DA-463	DA-464	DA-465	DA-466	DA-467	DA-468	DA-469	DA-470	DA-471	DA-472	DA-473	DA-474	DA-475	DA-476	DA-477	DA-478	DA-479	DA-480	DA-481	DA-482	DA-483	DA-484	DA-485	DA-486	DA-487	DA-488	DA-489	DA-490	DA-491	DA-492	DA-493	DA-494	DA-495	DA-496	DA-497	DA-498	DA-499	DA-500	DA-501	DA-502	DA-503	DA-504	DA-505	DA-506	DA-507	DA-508	DA-509	DA-510	DA-511	DA-512	DA-513	DA-514	DA-515	DA-516	DA-517	DA-518	DA-519	DA-520	DA-521	DA-522	DA-523	DA-524	DA-525	DA-526	DA-527	DA-528	DA-529	DA-530	DA-531	DA-532	DA-533	DA-534	DA-535	DA-536	DA-537	DA-538	DA-539	DA-540	DA-541	DA-542	DA-543	DA-544	DA-545	DA-546	DA-547	DA-548	DA-549	DA-550	DA-551	DA-552	DA-553	DA-554	DA-555	DA-556	DA-557	DA-558	DA-559	DA-560	DA-561	DA-562	DA-563	DA-564	DA-565	DA-566	DA-567	DA-568	DA-569	DA-570	DA-571	DA-572	DA-573	DA-574	DA-575	DA-576	DA-577	DA-578	DA-579	DA-580	DA-581	DA-582	DA-583	DA-584	DA-585	DA-586	DA-587	DA-588	DA-589	DA-590	DA-591	DA-592	DA-593	DA-594	DA-595	DA-596	DA-597	DA-598	DA-599	DA-600	DA-601	DA-602	DA-603	DA-604	DA-605	DA-606	DA-607	DA-608	DA-609	DA-610	DA-611	DA-612	DA-613	DA-614	DA-615	DA-616	DA-617	DA-618	DA-619	DA-620	DA-621	DA-622	DA-623	DA-624	DA-625	DA-626	DA-627	DA-628	DA-629	DA-630	DA-631	DA-632	DA-633	DA-634	DA-635	DA-636	DA-637	DA-638	DA-639	DA-640	DA-641	DA-642	DA-643	DA-644	DA-645	DA-646	DA-647	DA-648	DA-649	DA-650	DA-651	DA-652	DA-653	DA-654	DA-655	DA-656	DA-657	DA-658	DA-659	DA-660	DA-661	DA-662	DA-663	DA-664	DA-665	DA-666	DA-667	DA-668	DA-669	DA-670	DA-671	DA-672	DA-673	DA-674	DA-675	DA-676	DA-677	DA-678	DA-679	DA-680	DA-681	DA-682	DA-683	DA-684	DA-685	DA-686	DA-687	DA-688	DA-689	DA-690	DA-691	DA-692	DA-693	DA-694	DA-695	DA-696	DA-697	DA-698	DA-699	DA-700	DA-701	DA-702	DA-703	DA-704	DA-705	DA-706	DA-707	DA-708	DA-709	DA-710	DA-711	DA-712	DA-713	DA-714	DA-715	DA-716	DA-717	DA-718	DA-719	DA-720	DA-721	DA-722	DA-723	DA-724	DA-725	DA-726	DA-727	DA-728	DA-729	DA-730	DA-731	DA-732	DA-733	DA-734	DA-735	DA-736	DA-737	DA-738	DA-739	DA-740	DA-741	DA-742	DA-743	DA-744	DA-745	DA-746	DA-747	DA-748	DA-749	DA-750	DA-751	DA-752	DA-753	DA-754	DA-755	DA-756	DA-757	DA-758	DA-759	DA-760	DA-761	DA-762	DA-763	DA-764	DA-765	DA-766	DA-767	DA-768	DA-769	DA-770	DA-771	DA-772	DA-773	DA-774	DA-775	DA-776	DA-777	DA-778	DA-779	DA-780	DA-781	DA-782	DA-783	DA-784	DA-785	DA-786	DA-787	DA-788	DA-789	DA-790	DA-791	DA-792	DA-793	DA-794	DA-795	DA-796	DA-797	DA-798	DA-799	DA-800	DA-801	DA-802	DA-803	DA-804	DA-805	DA-806	DA-807	DA-808	DA-809	DA-810	DA-811	DA-812	DA-813	DA-814	DA-815	DA-816	DA-817	DA-818	DA-819	DA-820	DA-821	DA-822	DA-823	DA-824	DA-825	DA-826	DA-827	DA-828	DA-829	DA-830	DA-831	DA-832	DA-833	DA-834	DA-835	DA-836	DA-837	DA-838	DA-839	DA-840	DA-841	DA-842	DA-843	DA-844	DA-845	DA-846	DA-847	DA-848	DA-849	DA-850	DA-851	DA-852	DA-853	DA-854	DA-855	DA-856	DA-857	DA-858	DA-859	DA-860	DA-861	DA-862	DA-863	DA-864	DA-865	DA-866	DA-867	DA-868	DA-869	DA-870	DA-871	DA-872	DA-873	DA-874	DA-875	DA-876	DA-877	DA-878	DA-879	DA-880	DA-881	DA-882	DA-883	DA-884	DA-885	DA-886	DA-887	DA-888	DA-889	DA-890	DA-891	DA-892	DA-893	DA-894	DA-895	DA-896	DA-897	DA-898	DA-899	DA-900	DA-901	DA-902	DA-903	DA-904	DA-905	DA-906	DA-907	DA-908	DA-909	DA-910	DA-911	DA-912	DA-913	DA-914	DA-915	DA-916	DA-917	DA-918	DA-919	DA-920	DA-921	DA-922	DA-923	DA-924	DA-925	DA-926	DA-927	DA-928	DA-929	DA-930	DA-931	DA-932	DA-933	DA-934	DA-935	DA-936	DA-937	DA-938	DA-939	DA-940	DA-941	DA-942	DA-943	DA-944	DA-945	DA-946	DA-947	DA-948	DA-949	DA-950	DA-951	DA-952	DA-953	DA-954	DA-955	DA-956	DA-957	DA-958	DA-959	DA-960	DA-961	DA-962	DA-963	DA-964	DA-965	DA-966	DA-967	DA-968	DA-969	DA-970	DA-971	DA-972	DA-973	DA-974	DA-975	DA-976	DA-977	DA-978	DA-979	DA-980	DA-981	DA-982	DA-983	DA-984	DA-985	DA-986	DA-987	DA-988	DA-989	DA-990	DA-991	DA-992	DA-993	DA-994	DA-995	DA-996	DA-997	DA-998	DA-999	DA-1000
--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------

CHLORINATED METHANES
GENERAL RESOURCE INFORMATION

Department: CMP

Job Title: C-1530 MOD V General Information

Scope: To provide the operator with the necessary information needed to assist them in the training and operations of the C-1540 column.

C-1530 is an M2 finishing column which will be controlled by the Mod V controller. The control system has a total of 6 steps (220-225).

STEP 220 is the "MAINTENANCE WAIT" step .

There are no control activities taking place in this step. Anytime any work is to be done on this column which requires the column to be down the MOD should be placed in this step and tagged out properly.

STEP 221 is the "PROCESS WAIT" step.

There are no control activities taking place in this step. The MOD will be in this step just prior to starting up C-1530. The system should be lined up and valves stroked in this step.

C-1520 reflux drum, D-1521, will be level controlling to T-1500, via the level control valve AO(212), at approx 35%, AK(218). We are operating at a lower than normal level to allow for extra space during the feed swap over to C-1530.

Operator intervention to terminate

STEP 222 is the "ESTABLISH C-1530 LEVEL AND HEAT UP" step.

When the MOD is placed in this step, and, if a C-1520 reflux pump is running, indicated by DI(229) or DI(239) being "FALSE", C-1530 feed AOV, DO(222), will open. DC(260) will become "TRUE", changing AO(212)'s slave controller ramp setpoint, AC(907), to a value of (0) for 1 second. This will cause the feed control valve, AO(212), to C-1530 to close, cutting the feed to C-1530 momentarily. One second later, the slave controller ramp setpoint, AC(907), will begin slowly ramping up until it reaches the value that it had, AC(960), prior to opening the feed AOV, DO(222). Once reached AO(212) will assume a new level setpoint for D-1521, AK(205). This will allow for a much smoother transition, keeping us from over-feeding C-1530 during its initial start up.

If the bottoms level, AC(906), is already greater than the minimum level setpoint, AP(1219), or when it reaches it, and if the pumps, DO(208) and DO(218), are in automatic, the (A) pumps will energize. If for some reason the (A) pump fails to energize within a given time frame the (B) pump will.

Energizing the pumps will enable the bottoms control valve AO(223) and energize the bottoms AOV, DO(204), open. Once enabled, AO(223) will begin controlling C-1530 bottoms level AC(906) back to E-1500 at AK(201) setpoint. If there isn't sufficient level, the valve will remain closed and the pumps will be on total circulation via the ARC valves. This valve can be placed on flow control by giving AK(204) a value.

Also, when one of the bottom pumps energize, and if the bottoms level, AC(906) is greater than the minimum setpoint to begin steam, AP(1924), ALARM 271 will activate. When the board operator is ready to begin a steam flow, make DM(267) "TRUE", clearing the alarm and energizing the steam AOV, DO(225).

When the steam AOV, DO(225) is confirmed open, indicated by DI(225) being "FALSE", the steam control valve, AO(213), will become enabled. Once enabled, if the bottoms temperature, AI(237) is less than AP(1921) value, AO(213) will begin controlling a steam flow, AI(216), based on AK(276) setpoint, which will be set between 2000-5000# hr. This will allow the column to be slowly heated up. Once the bottoms temperature becomes greater than AP(1921), or, if the MOD automatically terminates to step 223, the master controller, DC(935), will become enabled and begin controlling the bottoms temperature AI(227) at AK(211) setpoint by automatically adjusting the steam to feed ratio, or, if you choose, go on straight ratio control by giving AK(233) a value between .01 thru 1.

Example. AK(233) has a value of .3

$$\begin{aligned} \text{AK}(233) * \text{C-1530 feed flow} &= \text{steam flow} \\ .3 * 15000\# \text{ feed flow} &= 4500 \# \text{ hr steam flow} \end{aligned}$$

The overhead pressure control valve AO(204) will attempt to control the selected overhead pressure AC(903) at AK(227) setpoint.

When the column pressure, AC(903), becomes 10# higher, AP(990), than E-1700 pressure, AC(1780) the vent control valve AO(233) will become enabled and begin controlling a vent flow, AI(206), based on AK(252) setpoint. If while running, ALARM(267) activates, indicating a high column pressure, and, if the pressure control valve, AO(204) is greater than approx 70-80% open, AP(1908), the ramp setpoint, AC(283), will automatically be increased, increasing the vent flow. However, at this time, once the alarm clears, the vent flow goes back to controlling AK(252) setpoint.

The MOD will automatically terminate this step when C-1530 bottoms level AC(906) becomes greater than AP(986) and the feed flow AI(225) is greater than AP(987) and the bottoms temperature AI(237) is greater than AP(1925) and the bottoms pumps are running.

STEP 223 is the " RUN C-1530 " step.

When the mod terminates to this step, if the master controller, DC(935), for the steam control valve, AO(212), hasn't yet become enabled, it will. (see steam valve in step 222 for control)

The bottoms AOV, DO(204), to E-1500 will be opened. However; the board operator can sample C-1530 bottoms and if good, go forward to T-804's by making DK(72) "TRUE". This will open the AOV, DO(224), to T-804 and close DO(204) to E-1500. DK(72) will be autozeroed if the mod moves to step 225, shutdown, due to alarms (265),(273) or (281).

STEP 224 is the " C-1530 CONTROLLED SHUTDOWN " step.

There is no control shutdown at this time. however code is left in so that in the event one is needed it is already there.

If you attempt to move to step 224, it will move right back to 223.

STEP 225 is the " C-1530 SHUTDOWN " step.

The MOD will AUTOMATICALLY MOVE to this step if SHDN ALARM 265 (high pressure), 273 (high level) or 281 (operator initiated) is activated.

When entering this step the MOD will CLOSE the feed control AOV, the steam control valve and AOV, level control valve, vent control valve and shut the bottoms pumps.

The pressure control valve AO(204) will remain active.

C-1530 IPT MODULE
PROCESS FAMILIARIZATION
TANKS AND VESSELS

PURPOSE: To familiarize you with the purpose, design, and operation of major tanks and vessels in your area. Including internal and external components (flanges, taps, baffles, etc) and explain their functions.

RESOURCES: P&ID'S, Experienced Personnel, Pressure Vessel Data Sheets

REQUIRED LEVEL OF PERFORMANCE: 100% Correct

OBJECTIVES:

1. Locate the following tanks and vessels in your area and explain their purpose. Include all inlet and outlet service flows (feed, btms, vent lines), destinations & product content (shell & tube).
 - A. C-1530 (column)
 - B. RE-1520 (reboiler)
 - C. E-1530 (btms exchanger)
 - D. EC-1530 (Integral overhead exchanger)
 - * 2. State where C-1530 vents to.
 - * 3. List all the places where C-1530 btms can be routed to and physically locate each line.
 - * 4. State where C-1530 gets its feed from.
 - * 5. State what coolant is used in EC-1530.
 - * 6. State what type steam is used on RE-1520.
 - * 7. Draw a simplified diagram of the equipment listed above and label the parts in their appropriate location.
-

C-1530 IPT MODULE
PROCESS FAMILIARIZATION
VALVE OPERATION

PURPOSE: To familiarize you with the location, type, operation and purpose of all valves used in your area. control valve operation will be covered in "CONTROL AND SENSING SCHEMES" section.

RESOURCES: Plant flow sheets, experienced personnel, pics display

REQUIRED LEVEL OF PERFORMANCE: 100% correct

OBJECTIVES:

- * 1. Physically locate, and operate (where applicable) the following valves.
 - A. AO(213) (steam to reboiler)
 - B. AO(204) (Cooling tower water to EC-1530)
 - C. AO(223) (C-1530 btms out)
 - D. AO(233) (C-1530 vent)
 - E. DO(222/232) (C-1530 feed AOV)
 - F. DO(204/214) (C-1530 btms to E-1500 AOV)
 - G. DO(224/234) (C-1530 btms to T-804's AOV)
 - H. DO(225/235) (Steam to reboiler AOV)
 - I. Manual block valve on steam at header.
 - J. Manual block valve on steam to reboilers at reboilers
 - K. Manual block valve on steam trap.
 - * 2. Given any valve, state if opened or closed.
-

C-1530 IPT MODULE
PROCESS FAMILIARIZATION
MECHANICAL EQUIPMENT

PURPOSE: To familiarize you with the function, location, and maintenance of the mechanical equipment in your area.

RESOURCES: Experienced Personnel, Equipment Manuals, Data Sheets

REQUIRED LEVEL OF PERFORMANCE: 100% Correct

OBJECTIVES:

- * 1. Physically locate and explain the operation and function of the following:
 - A. P-1530 A/B
 - * 2. Physically locate the following for the above listed items.
 - A. Field switch
 - B. Main switch gear
 - C. Shroud temperature transmitters.
 - D. Suction valve
 - E. Discharge valve
 - F. Recirculation valve
 - G. Bleed
 - H. Seal Purge (if applicable)
 - * 3. Explain how and if the above pumps are controlled by the mod.
 - 4. Explain the importance of monitoring the shroud temperature and what you should do if it is high.
 - * 5. List the safety devices for C-1530 and their setpoints.
(psv)
-

C-1530 IPT MODULE
PROCESS FAMILIARIZATION
CONTROL AND SENSING SCHEMES

PURPOSE: To give you a good understanding of the control and sensing schemes in the C-1530 area, including location and purpose of key instrumentation.

RESOURCES: P&ID'S, Experienced Personnel

REQUIRED LEVEL OF PERFORMANCE: 100% Correct

OBJECTIVES:

- * 1. Explain the function of the following controllers and how they operate.
 - A. AO(213) (steam to reboiler)
 - B. AO(204) (Cooling tower water to EC-1530)
 - C. AO(223) (C-1530 btms out)
 - D. AO(233) (C-1530 vent)
 - E. DO(222/232) (C-1530 feed AOV)
 - * 2. Explain the function of the following AOV's and how they operate.
 - A. DO(204/214) (C-1530 btms to E-1500 AOV)
 - B. DO(224/234) (C-1530 btms to T-804's AOV)
 - C. DO(225/235) (Steam to reboiler AOV)
 - * 3. Physically locate the following instrumentation and explain their function.
 - A. AI(203/213) (C-1530 level trans)
 - B. AI(224/234) (top pressure trans)
 - C. AI(216) (steam flow)
 - D. AI(206) (vent flow)
 - G. AI(226) (C-1530 to T-1500/T-804)
 - I. AI(239) (C-1530 diff press trans)
 - K. AI(237) (btms temp)
 - L. AI(263) (C-1530 ovhd temp trans)
 - M. AI(264) (E-1530 outlet temp trans)
 - * 3. Draw a detailed diagram of the system, including all controllers and instrumentation in items #1 and #2
-

DO 014119
CONFIDENTIAL

C-1530 IPT MODULE
CONTROL AND SENSING SCHEMES
MOD V OPERATIONS

PURPOSE: To give you a good understanding of the control and sensing schemes of the MOD V controller.

RESOURCES: P&ID'S, Experienced Personnel

REQUIRED LEVEL OF PERFORMANCE: 100% Correct

OBJECTIVE:

1. Demonstrate starting up C-1530 and be able to explain what is taking place in each step.
 2. Acknowledge and explain any given alarm.
 3. Explain the conditions in which the MOD will automatically rerout C-1530 btms to T-1500.
 4. Demonstrate changing any given setpoint and also explain what effect this change will have on the column.
 5. Explain the conditions in which the MOD will automatically begin ramping down the rates and place the column on recycle.
 6. State which valves and transmitters have abort code written and what are the conditions of the abort.
-

C-1530 IPT MODULE
PROCESS FAMILIARIZATION
AREA HAZARDS & PROTECTIVE MEASURES

PURPOSE: To familiarize you with the hazards and protective measures to reduce those hazards in your area.

RESOURCES: S&LP, Experienced Personnel, Safety Procedures

REQUIRED LEVEL OF PERFORMANCE: 100% Correct

OBJECTIVES:

- * 1. State the chemical hazards of C-1530
 - * 2. State the electrical hazards of C-1530.
 - * 3. State environmental problems and actions to be taken in event of the following spills:
 - A. Leak on C-1530 btms line
 - * 4. State the protective equipment requirements for maintenance on the following:
 - A. C-1530
 - B. RE-1530 (reboiler)
 - C. EC-1530 (fin fans)
 - * 5. List the safety devices and their setpoints for the following pieces of equipment:
 - A. C-1530
-

C-1530 IPT MODULE
PROCESS FAMILIARIZATION
OPERATING DISCIPLINE

PURPOSE: To give you a good understanding of operating parameters of the major equipment in your area. The problems associated with the process being out of operating parameters.

RESOURCES: Experienced Personnel, Operating Manuals,

REQUIRED LEVEL OF PERFORMANCE: 100% Correct

OBJECTIVES:

1. State the normal operating parameters of the following.
 - A. C-1530 top pressure
 - B. C-1530 btms level
 - C. C-1530 control temperature
 - D. C-1530 differential pressure
 - E. C-1530 btms temperature
 - F. C-1530 Vent flow
 - G. C-1530 overhead temperture
 - H. HCL in C-1530 bottoms
 2. State the results of high or low parameters and the results if it remains high or low.
 3. Demonstrate using the MOD V what should be done to bring these problems back to within their normal operating parameters. include all the instrumentation that you should monitor.
-

C-1530 IPT MODULE
SPECIAL SKILLS

PURPOSE: To allow you to demonstrate your ability to perform tasks in a logical and safe sequence, using established job procedures.

RESOURCES: Procedures, Experienced Personnel

REQUIRED LEVEL OF PERFORMANCE: 100% Correct

OBJECTIVES:

- * 1. Demonstrate/simulate in the field completing each task in a logical safe manner. (use yellow tags for simulation)
 - A. Line up C-1530 for start up.
 - B. Heat up the steam line to RE-1530.
 - C. Shut down C-1530 and isolate
 - D. Draining C-1530
 - E. Pad/Depadding
 - * 2. List the steps (in sequence) necessary to make the following equipment ready for maintenance:
 - A. C-1530
 - B. P-1530 A/B
 - C. RE-1530
 - D. PSV-C1530 A/B
-

C-1530 IPT MODULE
OPERATIONS ROUTINE CHECKLISTS

PURPOSE: To familiarize and allow you to demonstrate completing routine checklists in your area.

RESOURCES: Experienced Personnel, Round Sheets, Operating Manuals

REQUIRED LEVEL OF PERFORMANCE: 100% Correct

OBJECTIVES:

- * 1. Demonstrate making a round explaining each item and its importance.
-

C-1530 IPT MODULE
OPERATIONS
EMERGENCY PROCEDURES

PURPOSE: To familiarize you with emergency conditions and procedures in this area.

RESOURCES: Emergency Startup & Shutdown Procedures, Plant Personnel

REQUIRED LEVEL OF PERFORMANCE: 100% Correct

OBJECTIVES:

1. Given an emergency situation and shutdown procedure in this area, simulate (in sequence) shutting the area down. explain what is occurring in each step. include precautionary measures such as washing out and purging equipment. you will be tested on the following:
 - * A. Leak on C-1530.
 - * B. Fire
 - * 2. Your area has just experienced a power failure. explain your actions. (power is still off). your answer should be step-by-step.
-

C-1530 IPT MODULE
PROBLEM ANALYSIS

PURPOSE: To allow you to demonstrate your ability to handle abnormal situations (upsets) when they occur in your area.

RESOURCES: Procedures, Experienced Personnel, Operating Manuals

REQUIRED LEVEL OF PERFORMANCE: 100% Correct

OBJECTIVES:

1. List the sequence of steps you would take if the following condition were to occur.

- * A. HCL is high in the bottoms
- * B. DP across the column is increasing
- * C. Steam valve wound up
- * D. High/low level in C-1530
- * E. M3 in the bottoms is high
- * F. C-1520 pressure is high and still increasing.
- * G. Loss of steam flow.
- * H. Pressure control valve wound up.

* AN OS QUESTION.

GR 5/91

C1530MOD.IPT

CHLORINATED METHANES
GENERAL RESOURCE INFORMATION

Department: CMP

Job Title: C-1530/P-1530 General Information

Scope: To Provide The Operator With The Necessary Information Needed For
The Current IPT Training Program.

The function of C-1530 is to finish "METHYLENE CHLORIDE". The feed from C-1520 reflux drum D-1521 is level controlled (AO 212) via (P-1521) to C-1530. The feed consist of "METHYLENE CHLORIDE" and "LIGHTS", which are "METHYL CHLORIDE" and "HCL".

As the feed enters the column via AOV DO(222). The level in the bottoms of the column will start to increase. When a sufficient level has been established 30# Steam will be started through C-1530 reboiler RE-1530. As the steam begins heating up the bottoms product, the lighter components (lower boiling points) are vaporized and driven upward through the column. They pass through the integral overhead exchanger EC-1530 where the heaviest of these components (methylene chloride) are condensed by a cross exchange with cold cooling tower water (pressure controller). The condensed product begins flowing back down through the column as reflux, condensing the heaviest of the components on each tray. The components that were not condensed (M1 & HCL) are vented back (flow controlled) to the vent recovery system E-1700.

The cooling tower water control valve AO(204) on EC-1530 is the pressure control valve for C-1530. As the pressure on the column increase, the pressure transmitters (AI 224/234) located on the overhead line sends a signal to the MOD V controller, which in turn sends a signal to the control valve to open. This will increase the water flow through EC-1530 and condense more of the gas in the overhead, thus lowering the pressure.

During start up, the bottoms of the column will be level controlled to T-1500. Once the column has been lined out and sample results are within our product specs, the board operator can begin going forward into T-804 A or B.

Once the product has been started forward, cyclohexane is added into the stream. Cyclohexane is used as an inhibitor to keep the product from breaking down to HCL, causing discoloration. We try to maintain approx. 200 to 400 ppm cyclohexane concentration in the T-804's.

continued:

To help board operator determine how much load the column can handle, it is equipped with a differential pressure transmitter AI(239) which will indicate a differential pressure across the column. This will help us determine when the column has reached maximum capacity and also if flooding condition exist. The normal differential pressure is approx. 6 psig.

the normal concentrations of the bottoms product is 10-15 ppm water and 1-3 ppm hcl.

the normal operating temperatures on the bottom of the column is 85-87 deg c.

SAFETY

Required safety gear when catching samples on this column is Hard Hat, Scott-O-Vista, Rubber Gloves, Multi-bit Respirator and Monogoggles. Monogoggles and Multi-bit Respirator just have to be on operational personnel.

Required safety gear when opening lines are Hard Hat, Monogoggles, Gloves & Multi-Bit respirator. Monogoggles to be worn when breaking into lines.

Prior to any line opening the line must be drained, purged & properly tagged. Also, If contract workers are doing the break in, it is required that the line be initialed by DOW supervision or their designee and the contract foreman. Also a safe work permit has to be issued to the contract personnel and the redtag master accepted. (see line opening procedure).

Anytime work is performed in the piperack a safety harness is also required along with the minimum block standards.

Anytime PSV's have to be taken out of service, Monogoggles, Hard Hat, Gloves Have to be worn. Multi-Bit Respirator has to be on you person.

HAZARDS

The HAZARDS of this system is "CHEMICAL EXPOSURE", ROTATING EQUIPMENT, and FALLS.

CHEMICAL EXPOSURE

Exposure to Methylene Chloride could occur when performing normal job duties such as sampling or line opening. Proper safety gear must be worn.

ROTATING EQUIPMENT

C-1530 has 2 pumps which are taken out of service for repair. The proper safety gear must be worn when performing this operation. The Coupling Guard should be on these pumps at all time to protect personnel while working around the pumps, except when the pumps has been properly tagged and prepared for maintenance.

FALLS

C-1530 is equipped with ladders on the side of the column, giving access to the upper decks on the column. The ladder have a guard rail/cage around the ladder. Caution should be taken when climbing. Finger Rings are not allowed when climbing is involved.

The line to C-1530 run through the main pipe racks. Occasionally it becomes necessary to climb in the rack. A Safety Harness is required when entering the pipe rack.

ENVIRONMENTAL

To protect the column in the event the column overpressures the column is equipped with several safety devices such as safety valves which are set to relieve at 75 psig. There are numerous alarms on the MOD V control panel which will inform us of any potential problem. If a release should occur, Methylene Chloride will be emitted to the atmosphere.

OPERATING PARAMETERS

Top Pressure	48#
Btms Pressure	50%
Control Temp.	50 deg C
Differential press	5.5#
Btms Temperature	70 deg C
C-1530 Vent flow	50#
HCL in C-1530 btms	<5 ppm

DESIGN

Dimensions	2'6" ID x 60' Tan to Tan
Trays	33 valve trays
	Tray 1-21 Chrome steel
	Tray 22-33 Monel
Design Pressure	75 psig
Design Temperature	400 deg F

RE-1530

Design Pressure	
Shell/Tube	250/100 psi
Mat. of Construct	
Shell/Tube	Carbon Steel/ 70/30 cu/ni

EC-1530

Design Pres	75 psig
Design Temp	400 deg F

DO 014129
CONFIDENTIAL

P-1530's are C-1530 bottoms pumps. One of these pumps will energize when the MOD V controller is placed in step 222 and there is sufficient level in C-1530.

If both pumps are in the AUTOMATIC position in the field, the (A) pump will be the primary pump. When a sufficient level is reached the (A) pump will energize. If the (A) pump doesn't energize within approx 4-6 seconds the (B) pump will.

If while running the low flow alarm for this pump activates the spare pump will automatically energize.

the operator can energize the spare pump from the MOD by initiating a DM function, DM(135).

These pumps will automatically shutdown if we have a low level.

P-1530 is a sealless magnetic drive pump. (magdrive)

Speed	=	3500 rpm	
Flow	=	50	
volts	=	460	
Phase	=	3	
Hertz	=	60	
Mat of construction	=	Casing = Cast Steel	
		Impeller = Ductile Iron	

GR/TN 1/92
revised GR 8/92

C1530GEN.RES

DO 014130
CONFIDENTIAL

CHLORINATED METHANES
GENERAL RESOURCE INFORMATION

Department: CMP

Job Title: E-1530 General Resource Information

Scope: To provide the operator with the necessary information needed for the current IPT program

E-1530 is C-1530 bottoms fin fan cooler. It shares the same fans as C-1540 and C-1550 bottoms. Its purpose is to decrease C-1530 bottoms product temperature from approx 88 deg C to 39 Deg C. prior to entering the T-804's. This will keep the T-804s from venting as much to the psa system. The exchanger utilizes two fans which pull air up through the fans shroud across the outside of the tubes, cooling the product flowing through the tubes. This will keep the tanks that the product is being stored in from excessive venting.

The fans utilized in this system also supply air circulation for all the distillation bottoms coolers.

OPERATION/DESIGN

TUBES

Rows	=	4
Size	=	1" x 20'
Material of constr.	=	90/10 CU/N1
Design Pressure	=	150 psig
Design Temperature	=	-20-500 deg F

FANS

Motor	=	10 hp
Diameter	=	8 ft

TN 2/92
revised GR 8/92

E1530GEN.RES

DO 014131
CONFIDENTIAL

CHLORINATED METHANES
SAFE JOB PROCEDURE

Department: CMP

Job Title: C-1530 Drain Procedure

Scope: To Assist The Operator In Draining C-1530 When It Is Being Prepared For Maintenance.

Major Hazard(s): Chemical Exposure, Hot Lines.

Safety Equipment Required: Minimum Block Standards.

1. Ensure that the associated block valves are manually blocked in. With the exception of the bottoms level control valve AO(223).
2. Ensure that all AOV's that are used for isolation purposes and that are "FAILED CLOSED" valves, have the "AIR" to them shut off. With the exception of DO(204)
3. Connect a N2 hose to the top head of the reboiler if there's not sufficient pressure already on C-1530 and pressure the column up to approx 25# above T-1500 pressure. (BE SURE YOU USE THE CORRECT N2 HOSE INSTALLATION PROCEDURE). C-1530 SAFETY'S ARE SET AT 75#
4. Ensure that the bottoms AOV's to T-804'S are closed.
5. Open C-1530 bottoms AOV DO(204) to T-1500 .
6. Place the bottoms level control valve AO(223) in manual and open.
7. Place the bottoms pump in manual on the mod and give it a value of (1) this will energize the pump. Pump as much product as possible to T-1500.
8. When the board operator feels that the column is about to go empty station an operator by the pump. When the pump begins to gas out, immediately shut it down.
9. Place the bottoms level control valve and AOV back in automatic and ensure that it did close.
10. Hook up a N2 hose to the suction of the pumps. Block in the suction valve and discharge valve and blow N2 through the ARC valve. This will clear the lines of liquid.
11. Low point the following lines.
 - A. Suction line on pumps.
 - B. Reboiler
12. Hang the necessary tags needed for the job.
13. See Pad/depad procedure (where applicable).

DO 014132
CONFIDENTIAL

CHLORINATED METHANES
SAFE JOB PROCEDURE

Department: CMP

Job Title: C-1530 Pad/Depad Procedure

Scope: To Assist The Operator In Pad And Depading C-1530 When It Is
Being Prepared For Maintenance.

Major Hazard(s): Chemical Exposure, Inert Atmosphere.

Safety Equipment Required: Minimum Block Standards.

1. Ensure that C-1530 is completely drained of liquid.
2. Ensure that all the lines into and out of C-1530 are drained of liquid and all valves are manually blocked in.
3. Ensure that all AOV's that are used for isolation purposes and that are "FAILED CLOSED" valves, have the "AIR" to them shut off.
4. Run tubing on the downstream side of the vent control valve to a throx tie point to the dry header.
5. Block in the downstream block valve on the vent control valve and using the vent control valve, depressure C1530.
6. Connect a N2 hose to the top head of the reboiler and pressure the column up to approx 50#. (BE SURE YOU USE THE CORRECT N2 HOSE INSTALLATION PROCEDURE).
7. Using the vent control valve, begin depressuring the column to the throx. Monitor the throx while doing this.
8. Pad and depad until the system is clear.
9. Check with supervision and see if they want to leave a N2 purge on the system. If not, disconnect the N2 hose.
10. Hang the necessary tags.

TN 2/92

C1530PAD.PRO

DO 014133
CONFIDENTIAL

CHLORINATED METHANES
SAFE JOB PROCEDURE

Department: CMP

Job Title: C-1530 Controlled Shutdown Procedure

Scope: To Assist The Operator With the Safe & Controlled Shutdown Of C-1530.

Major Hazard(s): M2, HCL, Hot Lines, Hot Steam/Condensate.

Safety Equipment Required: Minimum Block Standards

NOTE: WE SHOULD BE ABLE TO PUT D-1521 BACK TO T-1500 FOR ABOUT 4 HRS
BEFORE IT PRESENTS ANY PROBLEMS, WHEN SHUTTING C-1530 DOWN.
(DEPENDING ON THE LEVEL IN T-1500)

1. Place C-1530 in the control shutdown step (224).

This will close the feed AOV (DO(222) and open the AOV from
D-1521 to T-1500 DO(202). Ensure that this took place.

2. Monitor T-1500 level and flow to E-1420. AO(132) T-1500 level
control valve will be attempting to control the level at AK(802)
setpoint.

The increase in the feed rate and the M2 concentration in T-1500
to D-1450 will change the composition of the feed to distillation.
Monitor C-1510/1520 operations when doing this.

If you think the change in composition is going to drastically
effect distillation, you can go on flow control with AO(132)
by setting AK(839) at a value greater than (0). Take the level
raise in T-1500.

3. Slowly decrease R-1300 rates using AK(111).

This will decrease the amount of M2 that is being made in R-1300
and slow down the level raise in D-1450 from T-1500.

4. Place C-1530 in step 225 (SHUTDOWN STEP).

* Ensure that control valves become disabled and closed.

5. When the levels in T-1500/D-1450 get to high we may have to shutdown
R-1300 and place the rest of distillation on total recycle.

(SEE R-1300 SHUTDOWN PROCEDURE)

C-1530 SYSTEM
CHLORINATED METHANES
START UP CHECK SHEET

DEPARTMENT: METHANES

JOB TITLE: INITIAL LINE UP AND START UP C-1530 (MOD V)

MAJOR HAZARDS: HCL, M2, HOT LINES

SAFETY EQUIPMENT REQUIRED: HARD HAT, MONOGOGGLES, RESPIRATOR, SAFETY
GLASSES AND HEARING PROTECTION.

SPECIAL PROVISIONS:

THE FOLLOWING ITEMS MUST BE CHECKED (YES) AND INITIALED PRIOR TO
C-1530 BEING STARTED UP.

NOTE: MAKE SURE ALL CONTROL VALVES ARE IN THEIR PROPER POSITION BEFORE
LINING CONTROL VALVES UP. (MOD V) (BOARDMAN)

	CHECK	INITIAL
A. HAVE ALL RED TAG MASTERS BEEN CLEARED AND TAGS PULLED. (OUTSIDE OS/SOS)	_____	_____
B. IS C-1520 RUNNING	_____	_____
C. IS D-1521 LEVEL GREATER THAN 35%	_____	_____
D. IS THE FLOW FROM D-1521 TO T-1500 BETWEEN (5000 - 10000# HR)	_____	_____
E. MAKE SURE THAT THE STEAM TRACING ON	_____	_____
F. HAS THE STEAM LINE TO C-1530 BEEN HEATED UP (USE THE 1" LINE AROUND THE AOV)	_____	_____
G. HAVE ALL QUICK OPENING VALVE BEEN BLOCK & BLINDED OR BULL PLUGGED.	_____	_____
H. MAKE SURE THE FOLLOWING MANUAL VALVES ARE LINED UP		
1. FEED VALVE AT COLUMN	_____	_____
2. BTMS OUT VALVE UPSTREAM OF PUMPS	_____	_____
3. CONDENSATE TRAP FOR RE-1530	_____	_____
4. STEAM VALVE AT HEADER	_____	_____

DO 014135
CONFIDENTIAL

C-1530 SYSTEM
START UP CHECK SHEET

PAGE 2

I. MAKE SURE THE FOLLOWING CONTROL VALVES ARE LINED UP
AND THE AIR TO EACH CONTROLLER IS OPEN.

1. AO(233) VENT CONTROL VALVE
2. AO(213) STEAM CONTROL VALVE
3. AO(223) BTMS CONTROL VALVE
4. AO(204) COOLING WATER VALVE

_____	_____
_____	_____
_____	_____
_____	_____

J. MAKE SURE THE FOLLOWING INSTRUMENTATION ARE
LINED UP.

1. AI(216) STEAM FLOW TRANSMITTER
2. AI(206) VENT FLOW TRANSMITTER
3. AI(234) & AI(224) PRESSURE TRANSMITTER
4. AI(239) DIFFERENTIAL PRESSURE TRANSMITTER
5. AI(203) & AI(213) C-1530 BTM LEVEL TRANSMITTER
6. AI(226) C-1530 BTMS FLOW TRANSMITTER

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

K. ARE THE PUMPS LINED UP AND FIELD SWITCHES IN AUTO
(THIS INCLUDE SUCTION, DISCHARGE, ARC VALVE & BLEEDS
CLOSED AND BLINDED)

_____	_____
-------	-------

L. MAKE SURE THE FLOW THROUGH SAMPLE POINT ON THE
PUMPS ARE LINED UP.

_____	_____
-------	-------

M. HAS THE ENTIRE SYSTEM BEEN WALKED OUT AND
LINED UP AND ARE ALL BLEED VALVES CLOSED AND
BLINDED. (OUTSIDE OS/SOS).

_____	_____
-------	-------

DATE/TIME: _____ APPROVED BY: _____
(SUPERVISOR) AND/OR (BOARDMAN)

C-1530 SYSTEM
MOD V CHECK SHEET

THE FOLLOWING ITEMS MUST BE CHECKED AND INITIALED PRIOR TO
START UP.

	CHECK	INITIAL
A. IS THE GPI SYSTEM WORKING PROPERLY	_____	_____
B. ARE ALL THE MANAUL DISCONNECT SWITCH IN THEIR CORRECT POSITION	_____	_____
C. ARE ALL THE LAMP BULBS ON THE MOD V WORKING PROPERLY	_____	_____
D. ARE THERE ANY (DS) ALARMS ON (IF SO CHECK OUT AND CALL HARDWARE PERSONNEL)	_____	_____
E. ARE BOTH MOD V COMPUTERS RUNNING	_____	_____
F. IS THE MOD V PRINTER WORKING PROPERLY	_____	_____
G. HAVE ALL ALARMS BEEN CLEARED. (ALARMS)	_____	_____
H. HAVE MANUAL SHUTDOWN SWITCHES BEEN RESET TO THEIR PROPER POSITION.(IF APPLICABLE)	_____	_____
I. HAVE THE ABORT KEY IN ITS PROPER POSITION	_____	_____
J. HAVE ALL THE PERMISSIVES FOR STEP (222) BEEN MET	_____	_____
K. MAKE SURE ALL CONTROL VALVES AND INSTRUMENTA- TION ARE IN THE AUTOMATIC POSITION ON THE MOD	_____	_____
L. IS THE MOD IN STEP 221 (PROCESS WAIT)	_____	_____
M. MAKE SURE THAT THE FOLLOWING (AK'S) AND (AP'S) HAVE THE CORRECT SETPOINTS.	_____	_____
1. AK(227) = () DEGC	BTMS TEMP	
2. AK(252)	VENT FLOW	
3. AK(233)	STM/FEED RAT	
4. AK()	PRESS	

WHEN THE ENTIRE CHECK SHEET HAS BEEN FILLED OUT AND ALL ITEM ARE
OK, THEN YOU CAN TERMINATE FROM STEP (221) TO STEP (222) AND LET THE
MOD V START UP C-1530.

DO 014137
CONFIDENTIAL

CHLORINATED METHANES
SAFE JOB PROCEDURE

Department: CMP

Job Title: C-1530 START UP PROCEDURE

Scope: To Assist The Operator With The Safe Start Up of C-1530

Major Hazard(s): M2, HCL, Hot lines, Falls

Safety Equipment Required: Minimum Block Standards Except When Climbing
Which Required a Safety Harness

1. Complete the C-1530 Start Up Check Sheet & Mod Check Sheet
2. Terminate step 221
3. Monitor level, temp, pressure & valve response during start up .
(if problems occur during start up don't hesitate to move to
step 225 and shut C-1530 down).
4. Verify the pumps energize when the level in the column becomes
greater than AP(270) value.
5. When the MOD terminates to step 223 and the temps/pressure looks
good, catch a C-1530 bottoms sample and analyze. If good, put
the product forward into T-804'S by making DK(72) "TRUE".

TN/GR 12/91

C1530SU.PRO

DO 014138
CONFIDENTIAL

CHLORINATED METHANES
GENERAL RESOURCE INFORMATION

Department: CMP

Job Title: C-1530 TROUBLE SHOOTING INFORMATION

Scope: To provide the operator with the necessary information needed to assist them in trouble shooting the plant.

IF ANY OF THE FOLLOWING CONDITIONS OCCUR CHECK SOME OF THE FOLLOWING:

A. High HCL concentration in the bottoms samples.

- *. Increase the steam flow/temp setpoint
- *. Increase the vent flow it may be insufficient
- *. Recheck sample.
- *. Check D-1521 sample for HCL.
- *. Make necessary adjustments on C-1520.
- *. Ensure we are operating at normal operating pressures.
- *. Check the feed flow it may be excessive. Also check D-1521 level control valve and make sure it is functioning properly.

B. D/P ACROSS THE COLUMN IS RISING

- *. Check the vent flow, may need to increase to help decrease the amount of reflux
- *. Cut steam, may be driving column to hard
- *. Check the feed rate. May be above max feed flow
- *. Check the BOTTOMS out of THE COLUMN make sure we have an adequate flow.
- *. Using guages verify the transmitter is functioning properly.
- *. Check the bottoms level transmitters and ensure they are functioning properly.

C. STEAM VALVE WINDING UP

NOTE: You should get an alarm if this condition occurs.

- *. Check the condensate trap may not be working.
- *. Check the reboiler shell side pressure. The reboiler may be dirty. (unlikely though)
- *. Check the temp setpoint and ensure it is set to the normal operating parameter.
- *. Check the 30# steam system and ensure we are running at the normal operating parameters.

(ntinued:

DO 014139
CONFIDENTIAL

D. HIGH PRESS. ON COLUMN

- *. Check pressure control valve and ensure that it is functioning properly.
- *. Check the steam control valve and ensure it hasn't come wide open due to some malfunction.
- *. Increase the vent flow setpoint. We may be taking an insufficient vent flow and building up with HC. Also check the vent recovery system pressure.
- *. Check the vent control valve and ensure that it is functioning properly.
- *. Check the cooling tower water pressure. Due to outside temperature and cooling tower sump temperatures we may be using a lot of water and the pressure may be low.
- *. Check the cooling tower sump temperature and lower it if possible. This will increase the efficiency of all the exchangers in the plant that use cooling tower water.
- *. If the cooling tower water pressure is low check the cooling tower pumps and ensure that at least two pumps are on-line. Also, ensure that we have an adequate level in the sump.
- *. Ensure that we don't have a build up of MUD in the sump.
- *. Open the bypass around the pressure control valve.

E. LOSE BTMS FLOW

- *. Check bottoms pump and ensure one of them is on-line.
- *. Check bottoms control valve make sure it is open
- *. Check the bottom AOV make sure it is working and open.
- *. Check the bottoms flow transmitter and ensure it is functioning properly.

F. HIGH OR LOW LEVEL IN C-1530

- *. Check level transmitter to ensure it is functioning properly also verify one level trans against the other.
- *. Run a trend chart on both level transmitter and see if there may be a problem
- *. Check the bottoms pumps and ensure they are running
- *. Check the bottoms control valve and ensure it is open and properly lined up.
- *. Check the bottoms out AOV and ensure it is open and hasn't failed (also check for DI/DO MISMATCH).
- *. Ensure that we haven't lost steam flow. (cond trap) or steam valve closed or steam AOV has failed closed.
- *. Ensure that we are at the correct operating pressure.

Continued:

LOW LEVEL:

- *. Check flow through sample point around btm c/v ensure that is was not left open.
- *. Check btms C/V may not be working properly.
- *. Check level transmitter to ensure it is functioning properly also verify one level trans against the other.
- *. Ensure that the steam valve is working properly and that we are not boiling everthing up the column.
- *. Ensure that we are at the correct operating pressure.

NOTE: CHECK ALL ALARMS

J. LOW PRESS. ON C-1530

- *. Using guages, ensure that the transmitters are correct.
- *. Check the pressure c/v and ensure it is functioning properly and that the valve is closed.
- *. Ensure that there is no bypass water around the control valve.
- *. Decrease the vent flow, it may be excessive.
- *. Check the steam flow and control valve. Also check the steam trap. (see steam valve wound up)

L. PRESSURE CONTROL VALVE IS WINDING UP.

- *. Check the cooling tower water pressure. Due to outside temperature and cooling tower sump temperatures we may be using a lot of water and the pressure may be low.
- *. Check the cooling tower sump temperature and lower if possible. This will increase the efficiency of all the exchangers in the plant that use cooling tower water. If the temperature in the sump is high check the fans.
- *. If the cooling tower water pressure is low check the cooling tower pumps and ensure that at least two pumps are on-line. Also, ensure that we have an adequate level in the sump.
- *. Ensure that we don't have a build up of MUD in the sump.
- *. Open the bypass around the pressure control valve.
- *. Backwash overhead exchanger
- *. Check the vent c/v may need to vent more to the vent recovery system.

M. M3 IN THE BOTTOMS SAMPLE IS HIGH.

- *. If out of spec, put back to T-1500.
- *. Check C-1520 reflux drum for M3.
- *. Check C-1520 temperature and adjust.
- *. Increase the reflux flow on C-1520.
- *. Reduce R-1300 rates if the columns are unstable and we are going back with M2 product for a lengthy period of time.

CHLORINATED METHANES
EMERGENCY PROCEDURES

Department: CMP

Job Title: Fire in The Distillation Area.

Scope: To Assist The Operator When An Emergency Situation Occurs.

Safety Equipment: Scott-Air-Pack

O.S Response

1. Start deluge guns .
2. Communicate your findings to the board operator or supervisor.
Tell the SOS to start the sprinkler system or if possible manually trip the system.
3. Make sure the area is clear of all NON-ESSENTIAL personnel.
4. Attempt to determine what's on fire.
5. Determine the area in which the fire is occurring.
 - * If the fire is on a section of line that can be isolated then do so immediately.
 - * If the pumps are on fire, hit them with the deluge gun, putting the fire out, then isolate. (the motors are shielded and should not be affected by the water)
 - * If the fire is underneath a tank or column, extreme caution must be used. The excessive heat can cause a pressure build up and the safety's will release causing a large spill with the potential for ignition.
 - * If the safety valve begins releasing, get out of the area.

S.O.S Response

1. Turn the sprinker system on in the area of the fire
 2. Hit the SPILL ALARM
-

EMERGENCY PROCEDURES
FIRE IN THE DISTILLATION AREA.

PAGE 2

CONTINUATION:

3. Announce over the PA system that we have an Fire and Possible spill and that all HOT WORK should be stopped.
4. Check the wind direction before announcing the evacuation point of all NON-ESSENTIAL personnel.
5. Call in the emergency to the front gate .
 - * Dial 333 and wait until everyone picks up
 - * Give them your name and location
 - * Tell them we have a fire and possible spill
 - * Tell them the level spill (If Applicable)
 - Category 1 = In Block
 - Category 2 = Out of Block
 - Category 3 = Out of Division
 - * Have someone available to meet security
6. Depending on the severity of the fire, weather you will have to shut down the plant and evacuate. (SEE SHUTDOWN PROCEDURE)

Supervisors Response

1. Asses the severity of the situation.
2. If a fire has the potential of cuasing an explosion concider the following.
 - A. Shut the plant down and evacuate.

NOTE: NOT ONLY OUR PLANT MAY HAVE TO BE EVACUATED BUT THE REST OF THE PLANTS IN THE DIVISION OR CLOSE PROXIMITY.

GR 12/91

DISTFIRE.EMR

DO 014143
CONFIDENTIAL

CHLORINATED METHANES
EMERGENCY PROCEDURES

Department: CMP

Job Title: Spill In The Distillation Area.

Scope: To Assist The Operator When An Emergency Situation Occurs.

O.S Response

1. Observe the spill from an area upwind or from a safe distance, Determine the area in which the spill is occurring. Determine if a SCOTT-AIR-PACK is needed.
2. Communicate your findings to the board operator or supervisor.
3. Clear the area of all craftsman and NON-ESSENTIAL personnel.
4. Determine the corrective action you are going to take.
 - * If the leak is on a section of line that can be isolated, and the line is identified, get the O.K. from the boardman or supervisor then block in the line.
 - * If the pump has blown a seal, swap pumps and shut the leaking pump down and isolate.

S.O.S Response

1. Hit the SPILL ALARM
2. Announce over the PA system that we have an Spill in the distillation area (state which area it is in) and that all HOT WORK should be stopped.
3. Check the wind direction before announcing the evacuation point of all NON-ESSENTIAL personnel.
4. Call in a Spill to the front gate .
 - * Dial 333 and wait until everyone picks up
 - * Give them your name and location
 - * Tell them the type of Product being released
 - * Tell them the level spill

Catagory 1 = small
Catagory 2 = medium
Catagory 3 = large

CONTINUED:

DO 014144
CONFIDENTIAL

EMERGENCY PROCEDURES
SPILL IN THE DISTILLATION AREA.

PAGE 2

Type spill

column	overheads	bottoms
C-1550	HCL/M1	M1/M2/M3/M4/HCL
C-1510	M1/M2/HCL	M2/M3/M4/HCL
C-1520	M2/HCL	M3/M4
C-1530	HCL	M2
C-1540	M3/CL2	M4
C-1550	CL2	M3
T-1500	M1/M2/M3/M4/HCL	
D-1525	M3/M4/CL2	

* Have someone available to meet security

5. Communicate with the supervisor/SOS/OS as to what systems may have to be shut down, or what bottoms/overhead line from a distillation columns may have to be rerouted, or if the leak is in a section of line that can be isolated without effecting the main operations of the plant.
6. If a distillation column has to be shutdown, SEE EACH COLUMNS INDIVIDUAL SHUTDOWN PROCEDURE.
7. Discuss with the supervisor the severity of the spill and wheather you will have to shut the entire plant down and evacuate.

Supervisors Response

1. Asses the severity of the situation.
2. If a leak on the column or tank should occur, concider the following.
 - A. Rope of the area, have fire fighting equipment availabe on the site.
 - B. Attempt to plug the leak if it is a small area.
 - C. Have the board operator shutdown/reroute equipment/product.

NOTE: IF THE COLUMN OR FEED TANK HAS THE POTENTIAL FOR A CATASTROPHIC FAILURE, SHUT THE PLANT DOWN AND EVACUATE.

CATASTROPHIC FAILURE: I.E. = IF THE VESSEL HAS LARGE CRACK IN THE WELD TO WERE THE ENTIRE VESSEL COULD RUPTURE WIDE OPEN.

CHLORINATED METHANES
SAFE JOB PROCEDURE

Department: CMP

Job Title: EMERGENCY PROCEDURE IN THE EVENT OF A MOTHER BOARD FAILURE

Scope: General information on possible ways to determine which mother board has failed and corrective measures

WAYS TO DETERMINE WHICH MOTHER BOARD FAILED

1. DS light #7 indicates which computer is driving the graphics display and alarm scan. This DS light is lit all the time when the left computer is driving the graphic display and when the light is off the right computer is driving the graphic display. They will automatically swap this job backwards and forwards on a time basis.

Another check that can be done is open the door on the MODV can and on the inside you will see rows of do cards with lights on them. In each row of cards the left row is for the left computer and the right row is for the right computer. All the lights should be on (may be dimly lit) if any of the lights are off or blinking then that computer is probably having problems.

By understanding the above information. If the system is acting up when the DS #7 light is on then it is likely the left computer (mother board) is the problem or if the system has problems with DS #7 light off it is likely the right computer is the problem.

2. If you can determine which computer is giving problems then that computer can be halted by using the switch below the computer and the other computer will continue to run the process. In the event the wrong computer was halted just turn the switch back on and halt the other one.

NOTE: If system is acting strange the system can be shutdown and problems with the computer can be repaired and system restarted.

NOTE: If you halted a computer always contact the area engineer as soon as possible so he/she can notified the proper people to have it repaired or contact the mod 5 hardware group directly. the mod hardware group is on call on a 24 hour basis.

NOTE: MOD 5 hardware group

PHONE #6248 AFTER HOURS 295-6770

DG/7/18/91

MODMOTHER.PRO

DO 014146
CONFIDENTIAL

CHLORINATED METHANES
SAFE JOB PROCEDURE

Department: CMP

Job Title: Starting and swapping MOD V operated pumps.

Scope: To provide the operator with the necessary information needed to properly start, swap and restart a MOD V operated pump.

Major Hazard(s): Not filling the pump bowl with liquid prior to starting can damage the pump when energized.

Safety Equipment Required: Minimum block standards for swapping. Scott -o- vista and rubber gloves to drain pumps.

Environmental Hazards. A chemical release due to a malfunctioning seal

NOTE: IF THIS PUMP IS A MAG DRIVE PUMP, MONITOR AMP AND PRESSURE. IF AMPS AND PRESSURE ARE SWINGING, THE PUMP MAY BE CAVITATING. TO PREVENT DAMAGE TO THE PUMP, SWAP PUMPS AND SHUT DOWN. IF THE AMPS ARE LOW AND THE PRESSURE HIGH, THE PUMP MAY BE DEAD HEADED.

I. Lining up a MOD V operated pump

1. Close and blind any bleed valves on the pump.
2. Line up the suction, discharge and recirculation. (check for leaks)
3. Bump the starter (on then back to off). This will fill the bowl up with liquid and help eliminate damage to the pumps (MAG DRIVE'S)
4. If both pumps are available for operation place the (A) pump field switch in the "AUTO" position first, then the (B) pump field switch. (When the switches has been placed in the auto position it will indicate to the MOD and the BOARD OPERATOR that everything is O.K.)

The MOD will start up the following pumps automatically, when the right conditions exist and the field switches are in "AUTO".

A. P-1250 A/B	F. P-1511 A/B	K. P-1540 A/B
B. P-1260 A/B	G. P-1520 A/B	L. P-1541 A/B
C. P-1320 A/B	H. P-1521 A/B	M. P-1550 A/B
D. P-1450 A/B	I. P-1525 A/B	N. P-1710 A/B
E. P-1500 A/B	J. P-1530 A/B	

The following pumps will have to be started by the board operator initiating a (DK) function.

A. P-1750 = DK(150) B. P-1760 = DK(100) C. P-1770 = DK(102)

The condensate pot pumps will have to be started by the outside operator.

I. SWAPPING MOD V OPERATED PUMPS AND PREPARING PUMP FOR MAINTENANCE.

In the event the pump that is presently on-line needs to be swapped, it will be necessary for the board operator to initiate a (DM) function to energize the off-line pump. The off-line pump must have the field switch in the "AUTO" position and already be lined up in the field. (NOTE: THERE ARE A FEW PUMPS WHICH WILL HAVE TO BE PLACED IN MANUAL TO SWAP, USUALLY ON THE TANKS)

The following is a list of the pumps that will AUTO START when their (DM) values are set:

A. P-1250 A/B	=	DM(210)
B. P-1260 A/B	=	DM(214)
C. P-1320 A/B	=	DM(136)
D. P-1450 A/B	=	DM(134)
E. P-1500 A/B	=	DM(100)
F. P-1511 A/B	=	DM(107)
G. P-1520 A/B	=	DM(130)
H. P-1521 A/B	=	DM(133)
I. P-1525 A/B	=	DM(131)
J. P-1530 A/B	=	DM(135)
K. P-1540 A/B	=	DM(150)
L. P-1541 A/B	=	DM(153)
M. P-1550 A/B	=	DM(155)
N. P-1710 A/B	=	DM(216)

1. Energize the pump by initiating the proper (DM) function
2. Once the board operator feels he has good control then shut down the other pump in the field by placing the field switch in the "OFF" position.

NOTE: If you are making a weekly or monthly pump swap, then set the pump up in the back up mode.

If the pump is in need of repair move to item # 3

3. Block in the suction, discharge and recirculation valves.
4. Bleed down using both bleed valves (suction and discharge bleed valves after the ARC valve). BE SURE TO ROD OUT THE BLEED VALVES TO MAKE SURE THEY ARE NOT PLUGGED.

If the CONTENTS are CHLORINATED HYDROCARBONS, you need to depressure the pump to the throx unit through the collection header. (DO NOT DEPRESSURE D-1525 OR C-1540 REFLUX PUMPS TO THE COLLECTION HEADER BECAUSE OF CHLORINE CONTENT)

5. Tag out the pump and check the field switch. (THE FIELD SWITCH WILL BE CHECKED BY THE OPERATOR WHO WILL ISSUE THE SAFE WORK PERMIT AND THE MAINTENANCE PERSONNEL WHO WILL BE WORKING ON THE PUMP.
6. Once the pump has been repaired, pressure it up and then follow the line up procedure.

CHLORINATED METHANES
SAFE JOB PROCEDURE

Department: CMP

Job Title: STEAM LINE HEAT UP PROCEDURE

Scope: General information on ways to properly heat up line.

1. To heat the steam line the 1" line around the steam aov will have to be manually open.
2. Then a small bleed on the upstream side of the steam control valve can be taken until all condensate is bled out. This will have to be done slowly to keep the line from hammering.
3. Once the line is free of condensate and is hot, then the jumper line between the steam header and condensate can be lined up to keep the steam line hot.
4. Then the bleed to atmosphere can be block at this time.
5. The steam control loop can be line up as needed.

DG/CB 09/24/91
revised GR 6/92

STEAMHEAT.PRO