APPENDIX A

Table A-1
SUMMARY OF PROBLEMS AND RECOMMENDATIONS FOR MBC UPGRADES

TABLE A-1
SUMMARY OF PROBLEMS AND RECOMMENDATIONS
PROCESS, NON-PROCESS, ELECTRICAL AND INSTRUMENTATION/ CONTROL FACILITIES

NO	FACILITY	PROBLEM	RECOMMENDATION	JUSTIFIC'N	CAPACITY LIMITER ?	PRIORITY	COST	DONE BY	REMARKS
Process Facilities									
P-1	Pig Retrieval Facility	NCWRP sludge forcemain not pigged since startup.	Trend pipeline pressures and pig pipeline when pressures show an increase.	O	NO	----	$0		
P-2	Raw Solids Receiving	1. Solids accumulation in suction pipe of mixing pumps.	Install flush/drain provisions	M O	NO	2	$40,000	IH	
		2. Lack of tank isolation valves can result in spill.	Install isolation valves at tank walls.	S	NO	1	$100,000	IH	
P-3	Raw Solids Degritting	1. No access to teacups and valves.	Install access platforms and hoist.	M O S	NO	1	$0	DC/BID	BC-3: Under construction
		2. Plugging of flexible grit piping.	Install properly sloped grit flex pipes with flush connections.	M	NO	1	$20,000	IH	
		3. Control strategy problems in operating the degritting system.	Review and tune the control strategy so that system functions automatically	O	NO	2	$0	IH	
		4. Odors from open grit waste lines. Inadequate foul air collection.	Pipe waste line directly to floor sink and enclose the floor sink. Upgrade foul air collection and ventilation system.	P S	NO	2	$120,000	DC	Note: Wasteline reroute done.
P-4	Biosolids Thickening	1. Single access hatch on cake wetwell.	Install a 2nd access hatch.	M O S	NO	2	$300,000	IH/ GRC	Cost is for items 1, 2 and 3.
		2. No lighting in wetwell for viewing.	Provide lighting in the wetwell.	M O S	NO	2	$0	IH/ GRC	ME-60: Design done. For construction.
		3. No mixing of biosolids in wetwell.	Install portable mixing system.	M	NO	2	$0	IH/ GRC	
		4. Plugging at transfer pump suction bells.	Remove loose floor liner and spray apply new liner.	M	NO	2	$10,000	IH /OM	
		5. Insufficient head of the thickened sludge transfer pumps to send flow to the digesters when screens/ blending tanks are by-passed during maintenance work.	Install pipe connection to reduce headloss	C_1	YES	2	$700,000	DC	Cost includes items P-4.5, P-5.1, P-6.1 and P-6.2

JUSTIFICATION CATEGORY:
C1 - MBC Capacity-Related; **C2** - Process System Capacity Related; **O** - Operation; **M** - Maintenance; **S** - Safety
PRIORITY:
Priority 1- Construct 1 to 2 years; **Priority 2**- Construct withing 2 to 5 years; **Priority 3**-Construct within 5 to 10 years; **Priority 4**- Construct after 10 years
DONE BY:
DC- Design Consultant; **IH**- In-House; **OM**- Operations & Maintenance; **GRC**- General Requirements Contracting; **BID**-Advertise Bid and Award Construction

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NO	FACILITY	PROBLEM	RECOMMENDATION	JUSTIFIC'N	CAPACITY LIMITER ?	PRIORITY	COST	DONE BY	REMARKS
P-5	Thickened Biosolids Screening	Sludge screens not in service. Intermittent operation of the thickened sludge transfer pumps configuration caused operational problems and would result in high wear and damage to screens.	Run thickened sludge transfer pumps constantly by providing a 3-way valve and a recycle pipe, downstream of the screens, to route sludge back to the wetwell.	M O	NO	2	$0	DC	
P-6	Thickened Biosolids Blending	1. Undersized digester feed pumps	Replace with higher head pumps.	C_1 M O	YES	2	See P-4.5	DC	
		2. Potential sludge spill from blending tank due to backflow from digesters.	Nine alternative solutions proposed which mitigate blending tank problems.	P S	NO	2	See P-4.5	DC	MBC-10: Alternatives under ME review.
		3. Undersized tank emergency overflow lines.	Same as 2 above	P S	NO	2	$0	DC	
		4. Plugging of sludge heat exchangers.	Relocate and trailer-mount heat exchangers to provide backup heating at the digesters instead.	C_1 M O P	YES	2	$10,000	IH /OM	
P-7	Anaerobic Digestion	1. Corrosion near the ferric injectors could cause digester spill.	Relocate FC injectors. Install double walled chemical piping.	M S	NO	1	$10,000	IH /OM	
		2. Combined digester overflow pipes.	Review overflow system.	C_1 O P	YES	2	$10,000	IH /OM	
		3. Structural damage risk from flawed tank overflow system.	Lower emergency overflow weir.	S	NO	1	$20,000	OM	
		4. Unsable gas generation and foaming due to excessive mixing	Maintain current 2 days per week operation of mixing pumps	O	NO	3	$0	OM	
P-8	Biogas Collection and Storage	1. Inoperative flares during power outage.	Provide emergency power to flares. See E 2.1 for details.	P S	NO	1	$100,000	IH/ GRC	Design Done. Negotiating construction contract.
		2. Condensate accumulation in biogas collection piping.	Continue to monitor biogas system.	O	NO	1	$0	OM	

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NO	FACILITY	PROBLEM	RECOMMENDATION	JUSTIFIC'N	CAPACITY LIMITER ?	PRIORITY	COST	DONE BY	REMARKS
P-9	Digested Biosolids Storage	1. PLWTP inflow surges cause Biosolids Storage Tanks to vent gas. Gas venting problem.	Determine and correct the cause of unstable flows.	C_1 P S	NO	1	$500,000	IH	
		2. Inadequate over pressure protection on the MBC portion of the FIRP pipeline.	Relocate rupture disk so that all on site portions of the FIRP pipeline are protected.	S	YES	1	$50,000	IH	
		3. Inadequate capacity of the dewatered biosolids transfer pumps.	Provided chopper type pumps with the correct Q/ H capacity.	C_1 M O	NO	1	$0	DC/BID	MBC-18: Design done. Under Construction
		4. Excessive grit in PLWTP inflow.	See #3 above. Also, continue to monitor now that PLWTP screens are online.	M	NO	1	$0	IH/OM	
		5. Spill risk from pipe punching through tank wall during a seismic event.	Install pipe expansion joints.	S	NO	2	$50,000	IH/EPM	
P-10	Centrifuge Dewatering	1. Redundancy problem as the standby centrifuge feed pump and polymer feed pump are not always available.	Add two dedicated standby centrifuge feed pumps and two dedicated polymer feed pumps.	C_1 O	YES	2	$1,500,000	DC	
		2. Undersized centrate collection piping system. Centrate backs up into centrifuges and overflows into foul Air duct system.	Complete phases 2 and 3 of this 3-phased project to address safety issues and to increase the capacity of the centrate collection system.	C_1 O M	YES	3	$2,000,000	DC/BID	MBC-3: Phase 1 done. Phase 2-Preliminary design completed.
		3. Scaling and solids cannot be cleaned from the 36" centrate collection pipe in gallery.	Investigate and install access/flush/drain ports on 36" centrate pipeline in gallery.	C_1 M	NO	1	$250,000	IH/EPM/ GRC	MBC-11: For design
		4. Erratic cake pump operation due to short cake bins resulting in increased pump maintenance. This occurs in process P-11 also.	Tune pump controls. Install and evaluate sensor flushing system.	C O	YES	1	$200,000	IH/EPM/ GRC	Preliminary design completed.
		5. No preheating of solids sent to centrifuges due to plugged sludge heat exchangers .	Review the need for heat exchangers. If not needed, remove units to provide space to work on nearby equipment.	O M	NO	4	$0	IH/GRC	
		6. Capacity limitations of centrifuges due to design/ operational constraints (Low hydraulic P.F. of 1.38 used)	Replace 4 of 8 existing centrifuges with 4 new and larger capacity units.	C_1 O M	YES	3	$6,000,000	IH/BID	

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NO	FACILITY	PROBLEM	RECOMMENDATION	JUSTIFIC'N	CAPACITY LIMITER ?	PRIORITY	COST	DONE BY	REMARKS
P-11	Dewatered Biosolids Storage and Loadout	1. Inadequate silo capacity during a "no loadout" weekend especially if a silo is out of service.	Add 2 more storage silos. Evaluate alternatives for additional truck loadout stations.	$\underline{C_1}$ O	YES	2	$8,000,000	DC/BID	
		2. Lime mixers plug frequently and limit cake feed to loadout bins.	By-pass the lime mixers.	C_1 $\underline{M}$ O	YES	1	$500,000	DC/BID	MBC-16: Under ME design. Construction bid package to include P-11.5.
		3. Piping configuration causes multiple trains of equipment to be removed from service when a valve or its actuator fails. Poor and/or unsafe access to these valves results in lengthy repair times impacting capacity.	Evaluate valve accessibility options including the use of scaffolding and provide best alternative.	C_1 $\underline{M}$ O $\underline{S}$	YES	2	$4,500,000	DC/BID	
		4. Leak from chilled water valves can damage MCC room equipment.	Reroute piping, relocate leaky valves and provide condensate drain from AHU.	$\underline{M}$ S	NO	1	$80,000	IH/GRC	
		5. Short landfill operating hours, combined with odor control issue related to on-site storage of loaded trucks, have reduced loadout capacity to the point that operating just one of the two loadouts will not meet production demands.	Provide totally independent, manually operated emergency loadout capabilities by installing direct feed piping from the centrifuges and the storage silos to two new truck loading stations.	$\underline{C_1}$ O	YES	2	$700,000	IH/BID	See P-11.2
		6. Changing regulations will likely require the production of Class A biosolids.	Construct new biosolids truck loadout facility separate from the existing facility.	$\underline{C_1}$ O	YES	4	$20,000,000	DC/BID	

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NO	FACILITY	PROBLEM	RECOMMENDATION	JUSTIFIC'N	CAPACITY LIMITER ?	PRIORITY	COST	DONE BY	REMARKS
P-12	Chemical Storage & Handling Systems	1. Motorized pump isolation and routing valves subject to damage by chemical flooding. Valves inaccessible for repair.	Eliminate unnecessary motorized valves. Relocate remaining valves or provide maintenance access.	M O P	NO	1	$1,200,000	DC/BID	MBC-13 and 14: To be designed. Cost is for items P-12.1,12.2,12.3, and 12.4
		2. Dual tank piping does not allow isolation of a single tank for maintenance. Entire chemical system must be shut down.	Evaluate tank piping for improvement.	M O P	NO	1	$0	IH/GRC	
		3. A break in the chemical transfer pipes can drain bulk storage tanks into the gallery.	Install a pipe highpoint to prevent tank siphon	O P S	YES	1	$0	IH/GRC	
		4. Operation of chemical transfer pumps starves the chemical feed pumps because of poor configuration of suction header.	Revise pump suction piping arrangement.	O P	NO	1	$0	DC/ BID	
		5. Electrical conduits penetrate the floor of chemical containment cells and allow migration of chemical to non-contained areas. This creates safety problems and damages equipment and wiring.	Evaluate options for re-routing electrical conduits.	C_1 M O S	NO	1	$600,000	DC	
		6. Perforated roof causes flooding of tanks containment cells which sets off leak detection alarms and shuts down the chemical system.	Raise the level of the liquid sensors to minimize problems. Evaluate installation of a solid roof to eliminate the problem.	O S	NO	1	$10,000	IH/ OM	MBC-2: O&M to do
		7. Unprotected single-walled chemical pipes can be easily damaged causing a chemical spill.	Install secondary containment piping around existing chemical pipes with visual leak indicators.	O P S	NO	1	$200,000	IH/ GRC	
		8. Isolation valves for the bulk chemical tanks can only be operated from within the containment cell.	Provide catwalk access to the valves or replace the existing manual valves with remotely operated motorized valves.	O S	NO	1	$300,000	DC/BID	

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NO	FACILITY	PROBLEM	RECOMMENDATION	JUSTIFIC'N	CAPACITY LIMITER ?	PRIORITY	COST	DONE BY	REMARKS
P-13	Polymer Storage & Mixing System	Use of two types of polymer resulted in inefficient use of the polymer mixing equipment and eliminates the redundancy needed for the dewatering process.	As only one polymer type is used at a time, combine the two systems to allow common use of mixing tanks and transfer pumps. This would also correct the lack of redundancy. Plant has accomplished this and is doing functional testing.	C1 O	YES	1	$65,000	IH/OM	MBC-24: Piping upgrade completed. New control strategy to be tested.
P-14	Dewatering Ferric Chloride Feed System	1. Original metering pumps have been discontinued and replacement parts will soon be unavailable.	Continue operational testing and performance evaluation of alternative pumps to determine the best selection.	M O	NO	1	$10,000	IH/ OM	
		2. The pumps are difficult to maintain due to very poor access.	Reconfigure pump and piping layout when new pumps are selected.	M	NO	1	$120,000	IH/ GRC	
P-15	Centrate Pumping Station	1. Low capacity of centrate pumps due to higher pressures resulting from scale buildup in the pipe.	Provide the ability to clean the pipe or prevent scale formation.	C1 M	YES	1	$250,000	IH/GRC	
		a. Inability to inspect or clean the 36-inch gravity pipline in gallery.	a. Provide inspection ports flushing/ draining connections.						
		2. Wetwell design is not "self-cleaning" and very difficult to manually clean.	Install a hatch directly above the wetwell to allow easy access for vactor trucks. Plant staff is testing the DCS controls strategy.	M	NO	3	$80,000	IH/ GRC	
		3. Even when in MANUAL mode, the motorized isolation valves for pump #2 close by themselves and shut off the pump. Staff has been unable to identify the cause of this problem.	Initiate a trial and error testing approach to replacing components, starting with the cheapest items first: replace the control wiring, then the electrical feed wiring, then the valve master station, etc.	C1 M O	YES	1	$20,000	IH/ O&M	

Non-Process Facilities

NO	FACILITY	PROBLEM	RECOMMENDATION	JUSTIFIC'N	CAPACITY LIMITER ?	PRIORITY	COST	DONE BY	REMARKS
N-1	Wastewater Pumping System	Discharge flow rate from the MBC wastewater pumps is restricted because of capacity issues at the downstream pump station, Muni PS86. Restricting MBC's discharge flow causes wastewater to overflow to centrate pump station which impacts OPRA emissions.	Upgrade WW pumps and by-pass Muni PS86 by extending MBC's discharge pipeline and discharge directly to a gravity trunk sewer.	C2 P	NO	1	$1,200,000	DC/BID	

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NO	FACILITY	PROBLEM	RECOMMENDATION	JUSTIFIC'N	CAPACITY LIMITER ?	PRIORITY	COST	DONE BY	REMARKS
N-2	Odor Control Facilities	1. Area 60:		C_2 M P	NO	1	$2,400,000	DC/BID	MBC-4: For design
		a. High static pressures on odor fans resulting in low foul air flow	a. Upgrade main odor control fans and address causes of high headloss						
		b. No maintenance access or position indicators for motorized dampers. (Includes access platforms in other areas)	b. Provide access and position indicators						
		c. Excess moisture in ducts and in carbon scrubbers increases pressure losses across the carbon and reduces air flow resulting in capacity loss.	c. Provide a deep in-line sump with a gravity drain line prior to the carbon scrubber.						
		2. Area 76 Grit Room:							
		Open odor sources and poor foul air collection.	Implement B&C's recommended improvements to better capture foul air.	O P S	NO	1	$500,000	DC/BID	
		3. Area 86:	Area 86:						
		a. Poor foul air collection from loadout process creates an unfavorable work environment.	a. Upgrade foul air collection system at truck loading bay.	P S	NO	1	$1,650,000	DC/BID	
		b. Truck exhaust fumes create an unfavorable environment for operators.	b. Provide operator control booth with fresh air supply. Also, evaluate the possibility of using truck exhaust snorkle ducts.	P S		1	$200,000	IH/GRC	Design complete. Negotiating construction contract.
		4. Area 94:							
		a. Low foul air flow through the odor control system.	a. Investigate and correct cause of low air flow.	C_2 M P	NO	1	$250,000	DC/BID	Cost is for N-2.4a and 2.4b
		b. Uncovered centrate wetwell requires that the entire room be ventilated at a higher exchange rate.	b. Cover centrate wetwell and draw foul air from below the cover. Reduce the air exchange rate in the rest of the room.	M O		1	$0		

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NO	FACILITY	PROBLEM	RECOMMENDATION	JUSTIFIC'N	CAPACITY LIMITER ?	PRIORITY	COST	DONE BY	REMARKS
N-3	Plant Water Systems	1. The capacity of the 6-inch potable water (PW) supply to the plant's air gap tanks and the capacity of the process water (PRW) system cannot meet the peak plant water demands when the reclaimed water (RW) supply is interrupted.	Use the plant's 4-inch PW supply to feed additional water into the PRW system. This would require installation of a new air gap tank and 2 new process water pumps at the east end of the pipe gallery. See Figure 4-1 for details.	C1 O	YES	1	$500,000	DC/BID	Cost is for items N-3.1 & 3.2.
		2. The water supply and the water demands are located on opposite ends of both the PRW and the WU systems. The length of these distribution systems results in low supply pressures which cause process equipment to trip off.	Use the existing 8-inch RW pipe, located at the east end of the pipe gallery, to provide additional water into and stabilize the pressures in the PRW and the UW systems. See Figure 4-1 for details.	C1 O	YES	1	$0	DC	
		3. The bladders in the hydroneumatic tanks rip immediately after the tanks are placed in service and the manufacturer has been unable to identify the problem. This causes rapid pressure fluctuations in the PRW system as the pumps cycle on and off quickly.	Eliminate the internal bladder by relocating the PRW connection from the top to the bottom of the hydropneumatic tanks.	M O	NO	2	$30,000	IH/OM	
		4. Missing general isolation valves throughout water systems	Install missing isolation valves	O M	NO	1	$200,000	IH	
		5. Missing UPS connection on airgap tank inlet valves	Provide UPS for air gap tank inlet valves	O M	NO	1	$50,000	IH/GRC	

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NO	FACILITY	PROBLEM	RECOMMENDATION	JUSTIFIC'N	CAPACITY LIMITER ?	PRIORITY	COST	DONE BY	REMARKS
N-4	Hot Water System	1. Control problem where the boilers get stuck in low-fire mode. This problem is complicated by COGEN's tie-in location.	Re-evaluate the HWS controls and the location of the COGEN tie-in. Optimize if possible.	O	NO	1	$20,000	IH/OM	
		2. Inefficient operation of MBC's HW secondary loop pumps due to poor design coordination with COGEN's and HWS feed pumps.	Investigate the use of a variable speed drives for COGEN's pump.	O	NO	1		IH/OM	For review with Energy Group
N-5	Chilled Water System	1. Lack of capacity (redundancy) during peak summer demands due to decommissioning of COGEN CWS.	Evaluate adding a 3rd chiller or upgrading the existing ones.	C2 O	NO	1	$20,000	IH	
		2. Inefficient operation due to the absence of a 3-way temperature control valve and the location of the COGEN tie-in.	Re-evaluate the CWS controls and the location of the COGEN tie-in. Install a temperature control valve.	O	NO	1	$0		For review with Energy Group
N-6	Storm Water Drainage System	1. Erosion downstream of the west storm water discharge structure.	Eliminate the west discharge structure by re-routing flow to the east discharge structure.	M S	NO	2	$3,000,000	DC/BID	BC-2: Design done. Cost is for items N-6.1 and 6.2
		2. Several process areas, including sludge and chemicals, flow directly to storm drains.	In addition to the above items, provide a new holding tank just prior to the east discharge structure to catch the first flush and any chemical spills. Return the captured flow to the plant's sewer system.	O P S	NO	2	See # 6.1		
		3. Access road erosion caused by poor CALTRANS drainage.	Construct drainage improvements to intercept and re-direct the storm water away from the access road.	M S	NO	1	$100,000	DC/BID	BC-2: Design done. For construction

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Electrical Facilities

NO	FACILITY	PROBLEM	RECOMMENDATION	JUSTIFIC'N	CAPACITY LIMITER ?	PRIORITY	COST	DONE BY	REMARKS
E-1	OPS Building (Area 51)	The three UPS's that feed the DCS workstations and the fiber optic hub to COMC are not supported by the emergency generator located in this building. A power outage can result in the loss of critical data as well as a loss in communication to COMC.	Connect the three UPS's in Area 51 to the existing generator as planned under the M&E Contract.	O	NO	1	$10,000	IH	
E-2.1	Digesters Complex (Area 80)	Flares are inoperable during power outages. See P-8.	Connect the electrical panel feeding the flares to the existing generator in Area 76 as planned under the M&E Contract.	P S	NO		$0		See P-8.
E-2.2	Centrifuge Building (Area 76)	During a power outage, foul air and hazardous gases accumulate in the centrifuge building, including the operator control room.	Provide a new external Air Supply Fan to the control room that is independent of the air handling unit. Connect this fan through the generator in this building for back-up power during a power outage. Identify the load on the existing generator to make sure the generator is not overloaded.	S	NO	1	$70,000	IH/EPM	
E-2.3	Centrifuge Building (Area 76)	The UPS's that feed the DCS bridge workstations, Drop 210 and Drop 220, are not supported by the emergency generator located in this building.	Connect the UPS that feeds Drops 210 and 220 to the emergency generator in this area.	C_2 O	NO	1	$50,000	IH	
E-2.4	Centrifuge Building (Area 76)	No lights in Thickened Biosolids wetwell (See P-4.2)	Provide lighting for the wet well as planned under the M&E Contract.	O	NO	1	$0		See P-4.2
E-3	Wastewater Pump Station (Area 94)	No back-up power to any pumps in Area 94. Power outages, either planned or unplanned, can result in on-site sewage spills and can flood the dry well.	Provide a small generator for back-up power for the 15 hp wastewater pump in Area 94.	M P S	NO	1	$250,000	DC/GRC	

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E-4	Fire Alarm System	Self diagnostic feature for the smoke detectors does not function.	Check the self diagnostic features of the existing Fire Alarm devices to comply with code. Repair/upgrade as needed.	PS	NO	1	$150,000	IH/OM	
E-5	Sub Stations & Main Plant Switchgear	IQ analyzers cannot be serviced or replaced with COGEN on-line. This significantly impacts the ability to service or repair these units.	Provide maintenance and service as needed for the Power Quality Analyzers.		NO		$0	IH	
			Replace IQ Analyzers if needed. Provide coordination with COGEN provider for off season repair or replacement.				$0		
			Investigate ways to service IQ analyzers without having the COGEN off-line.				$0		
E-6.0	Electrical - General	As-Built drawings are not up to date.	Determine a process to update as-built drawings and existing conditions.	----	NO	----	$0	-----	
E-6.1	Electrical-General	Existing UPS's are un reliable, particularly UPS in Areas 51, 60, 70 and 80	Determine reliability of the existing UPS's and identify necessary upgrades.	O	NO	1	$0	DC	
E-6.2	Electrical-General	When a fault is detected on the Utility side the Utility breaker trips and the COGEN goes down resulting in Plant power outage. When the Utility power goes down the COGEN tries to feed the grid and trips off due to overload.	**Alternative Solutions:** 1. Provide Dual Fuel Generating units to feed Bus "B". Utility and COGEN to feed Bus "A".	C1, O	YES	1	$2,000,000	DC	
			2. Reconfigure switchgear configuration to provide Plant wide diesel standby units.				$0		
			3. Identify all critical loads of the Plant and connect to smaller generators.				$0		
			4. Reconfigure COGEN to connect to main B breaker and landfill demand current COGEN breaker				$0		

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E-6.3	Electrical-General	Utility feed to MBC has not been very reliable, resulting in unpredictable power outages. When SDG&E goes down the COGEN also goes down resulting in complete unreliability of power for the Plant.	Discuss power reliability with SDG&E and provide necessary power upgrades on SDGE side of equipment.	C_1	YES		$0		
Instrumentation/ Control Facilities									
C-1	All Areas	I/O limitations, Data Highway #1 & 2 cannot be expanded. #1 is totally maxed-out on I/O & DPU #2 has minimum I/O & DPU available #3 is expandable	Unused or bypassed SID recovery and DPU cleanup can be achieve by reprogramming. Note that this process involves high cost, high man-hours, and down time.	----	----				
C-2	All Areas	Impact on upgrades (alternatives considered, selection, design). Positive impact.	Upgrade to Ovation, and also other peripherals that's not compatible with the system. Costly but will solve most or all problems by having new program & system.	----	----				
C-3	All Areas	Will not know how much I/O space will be able to retrieve before clean-out.	Will have to be studied and planned very carefully before performing to see if it is beneficial than upgrading to Ovation. Will be a big waste of time and money if not well planned and compared to upgrade.	----	----				
C-4	All Areas	DPU database limitations	Database recovery cleaning-up DPU by reprogramming.	----	----				
C-5	All Areas	Historian Optical drive should be upgraded/expanded the new drives are not compatible with the existing software	The software should also be upgraded to work with the new drive. Upgrade to Ovation.	----	----				
C-6	All Areas	DCS reprogramming clean-out will cost a lot of time and money.	Thorough study and planning before performing or upgrade to Ovation.	----	----				
C-7	All Areas	DCS graphics outdated	Reprogram graphics or upgrade to Ovation.	----	----				

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NO	FACILITY	PROBLEM	RECOMMENDATION	JUSTIFIC'N	CAPACITY LIMITER ?	PRIORITY	COST	DONE BY	REMARKS
C-8	All Areas	The alarms and points disabled are still in the system using space in the I/O & DPU	Reprogramming to retrieve alarm points & I/O. If the recovery is not sufficient for the need to expand the time used and high cost spent will be wasted. The best way is to upgrade to Ovation.	----	----				
C-9	76 Area	Centrifuge expansion on Octopus system by Square D. Outcome not known yet.	If successful, this system can be easily incorporated to Ovation.	----	----				
C-10	All Areas	Limitorque vendors not responsive/lack of support & software not readily available.	Remove the Valve Master Station (VMS) then direct connect to the DCS.	----	----				
C-11	All Areas	Excessive use of valve actuators.	Remove unneeded valve actuators then cleanout the control loop/wiring/etc…	----	----				
C-12	Areas 60, 94	Actuators installed inside chemical containment area.	Relocate the valve actuators above or outside the chemical containment area.	----	----				
C-13	All Areas	Unreliability of Limitorque	Replace with Rotork or equivalent.	----	----				
C-14	All Areas	Limitorque VMS does not have HMI to quick change settings, addressing, and manually manipulating the valves.	Replace with a more reliable Rotork.	----	----				
C-15	Area 76	The VMS located at Area 76 centrifuge level create frequent problems due to bad atmospheric conditions and water wash downs.	Relocate the VMS to Area 76 MCC room for better condition and eliminate water wash down problems.	----	----				
C-16	Areas 70, 51	STAEFA Systems product line discontinued.	Change BCUs' to Allen-Bradley PLC	----	----				
C-17	Areas 70, 51	Not all is monitored or controlled by the DCS.	Replace system control to A-B PLC then interface to the DCS to control the system.	----	----				
C-18	Areas 70, 51	Ethernet link needed to upgrade to newer version of INSIGHT, telephone line will not work.	Replace telephone link with Ethernet.	----	----				
C-19	Areas 70, 51	MS 1800 support is limited due to lack of Siemens staff that is familiar with the program.	Upgrade to Ovation.	----	----				