- **Board of Directors**
  Engineering and Operations Committee

February 14, 2006 Board Meeting

8-3

Subject

Appropriate $2.4 million; and authorize final design, materials procurement and fabrication for six Colorado River Aqueduct reliability projects (Approps. 15373 and 15374)

Description

The Colorado River Aqueduct (CRA) is a 242-mile-long conveyance system which transports water from Lake Havasu to Lake Mathews. The CRA consists of five pumping plants, 124 miles of tunnel, 63 miles of concrete-lined canal, 55 miles of cut-and-cover conduit, inverted siphons, and reservoirs. The CRA provides the only means for Metropolitan to convey water from the Colorado River to Southern California.

Rehabilitation of the CRA was initiated in 2001 and is expected to be substantially completed by 2009. To execute this rehabilitation effort, four major programs were identified within Metropolitan's Capital Investment Plan (CIP). Two of these programs focus on rehabilitation of the conveyance system and the pumping facilities. Six projects are recommended to proceed at this time. Each project has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds have been included in the capital budget for fiscal year 2005/06.

CRA Conveyance Reliability Program

Cast Iron Blow-Off Replacement Phase 4 – Final Design and Fabrication ($970,000)

As a result of the failure of the Big Morongo siphon blow-off in March 2003, Metropolitan began systematically replacing all cast iron blow-offs and pump wells with more reliable steel components. To date, approximately 120 cast iron blow-offs and pump wells have been upgraded in three phases, based on the condition and relative risk posed by those structures. The fourth and final phase will complete the replacement of approximately 75 remaining blow-offs and pump wells.

Staff recommends proceeding with final design and fabrication at this time. As with previous phases, Metropolitan forces will procure materials and fabricate pipe fittings for contractor installation. Authorization for materials procurement and fabrication is requested at this time due to the long lead-time required for these activities.

This action authorizes final design, fabrication, and all work necessary in advance of award of an installation contract. Final design is planned to be completed in June 2006, and fabrication by December 2006. Installation under a construction contract will occur during a CRA shutdown scheduled for early 2007.

Aqueduct, Reservoir and Discharge Line Isolation Gates – Preliminary and Final Design ($435,000)

In order to repair individual features along the CRA such as the head gates, siphons, or segments of the aqueduct, the pumping plants must be shut down and large portions of the aqueduct or reservoirs must be drained. Use of gates to isolate segments or divert flows would minimize disruption to water deliveries and reduce draining of the aqueduct or reservoirs to perform scheduled maintenance or emergency repairs. For example, aqueduct isolation gates are presently used to isolate siphons along the aqueduct while maintaining partial flow through a parallel siphon, but only six isolation gates of differing sizes exist to serve the dozens of siphons spread throughout the 242-mile-long aqueduct.

Staff recommends that the following isolation gates be added throughout the CRA system: fifteen additional siphon isolation gates to ensure adequate isolation capability on all reaches of the aqueduct; two reservoir

isolation bulkheads for repairs on the aqueduct upstream of the Gene Wash and Copper Basin reservoirs, eliminating the need to drain those reservoirs; four pump discharge line isolation gates for repairs of a pumping plant head gate or discharge line while maintaining partial flow out of adjacent lines; and twenty bypass line gates to isolate individual pump discharge lines.

As part of this project, mounting flanges will be installed on the face of the conduit portals leading into the reservoirs to accept the sixteen-foot diameter reservoir isolation gates. The large reservoir isolation gates will have air chambers to control the placement of the gates underwater. At each pumping plant's surge chamber, guides and operators will be installed to open and close the bypass line isolation gates, and new monorail cranes will be installed at the top of the surge chambers to allow installation of a pump discharge isolation gate in either one of three discharge lines.

This action authorizes preliminary and final design of the aqueduct, reservoir, and discharge line isolation gates. Final design is planned to be completed in June 2006. Fabrication and installation is planned to be completed in July 2007 under a construction contract.

San Jacinto Diversion Structure and Warren Road Gates Rehabilitation – Preliminary and Final Design ($430,000)

Three slide gates, one radial gate and a flow meter at the San Jacinto Diversion Structure, and two radial gates at the Warren Road facility, require refurbishment. The gates were installed over 50 years ago and have mechanical operating mechanisms which are near the end of their life expectancy, and have coatings which are deteriorated and are in need of recoating. The flow meter at the San Jacinto diversion structure is used to assess conditions in the San Jacinto tunnel and is not providing accurate flow readings.

Staff have assessed the San Jacinto and Warren Road facilities and recommend recoating the three 6-foot by 8-foot slide gates and the three 15-foot-wide radial gates, including repairing any corroded steel members. Staff also recommends replacing the slide gate operators with new hydraulic operator systems, refurbishing the electrical system which supplies power to the slide gates with new cables, switches and panels, and replacing a deteriorated portable backup generator with a more reliable, permanently mounted model. A new flow meter with sensors that extend further into the tunnel is also recommended at the San Jacinto Diversion Structure. This type of flow meter will provide accurate measurements. Much of the construction work will be performed during the shutdown planned for early 2007.

This action authorizes preliminary and final design of the San Jacinto Diversion Structure and Warren Road slide gates, flow meter and radial gates rehabilitation. Final design activities are planned to be completed by June 2006, and repairs are planned to be completed in July 2007 under a construction contract.

Desert Water/Coachella Valley Service Connection Valve Replacement – Preliminary Design ($75,000)

At the Desert Water/Coachella Valley service connection DWCV-4, four 16-inch manually operated plug valves have degraded significantly and are in need of replacement. These valves are used to release Colorado River water to Desert Water Agency and Coachella Valley Water District's percolation ponds near the Whitewater River in exchange for State project water. Operation of these 25-year-old valves has become increasingly difficult due to deterioration caused by their high-velocity flows. The valves cannot be refurbished due to the degree of wear. Replacement of these valves with 20-inch diameter, electrically operated butterfly valves will ensure reliable operation of the service connection and enable Metropolitan staff to more efficiently control the flow of water released.

Under this project, the existing 16-inch-diameter valves will be removed and replaced with 20-inch-diameter valves. Modifications will be made to the piping to accommodate the larger valves. New electric service will be extended to the site from a neighboring structure to feed the new electric operators. Communication systems will be added to enable remote monitoring and control of the valves. In addition, improvements will be made to access features in the DWCV-4 structure, such as ladders and handrails.

This action authorizes preliminary design of the DWCV-4 improvements. Preliminary design is planned to be completed in June 2006 and final design in September 2006. Installation is planned to be completed in July 2007 under a construction contract.

Access Structure, Transition Structure, and Manhole Covers Replacement – Preliminary Design ($100,000)

Along the CRA conveyance system, approximately 170 covers for access structures, flow transition structures, and manholes require replacement. The function of these covers is to restrict unauthorized access to the aqueduct and protect it from soil and debris intrusion. The original steel covers, which are over 60 years old, are deteriorating due to weathering and corrosion. The covers vary in size from approximately 3 feet wide by 9 feet long for manhole openings, to 18 feet wide by 24 feet long for transition structure openings. In addition, deteriorated steel handrails around the large transition structure openings will be replaced, and walls of the concrete manholes will be repaired and raised if needed to meet operational needs.

This action authorizes field data collection and preliminary design of the 170 replacement covers for the access structures, transition structures, and manhole covers. Preliminary design is planned to be completed in June 2006, and final design in September 2006. Fabrication and repairs are planned to be completed in December 2007 under a construction contract.

CRA Pumping Plant Reliability Program

Suction and Discharge Line Joint Repairs – Preliminary and Final Design ($390,000)

Pump suction and discharge line pipe joints are leaking at several places at all five CRA pumping plants. Leaks have been detected at the bell and spigot joints of the 66-inch-diameter suction line elbows at Gene, Iron Mountain, Eagle Mountain, and Hinds pumping plants, and at the riveted joints of the 10-foot-diameter discharge lines of all five pumping plants. These leaks have been monitored for several years, and although the volume of leakage is low, it is causing the joints to corrode. Over the years, corrosion of the joints has increased, and those corroded joints could eventually fail, limiting Metropolitan's ability to pump water.

Under this project, approximately thirty corroded bell and spigot joints will be replaced during the shutdown planned for early 2007. The joints will be cut out to reveal sound metal, and new couplings welded to the existing pipe. This work will be performed in cramped quarters, three stories below ground, and will require disassembly of adjacent large diameter valves. The leaky riveted joints will be repaired with an internal sleeve. Adjacent coatings will be repaired as needed.

This action authorizes preliminary and final design of the suction and discharge line joint repairs. Final design is planned to be completed in June 2006. Repairs are planned to be completed in July 2007 under a construction contract.

Engineering Design Services – MWH Americas (Separate Board action)

Preliminary and final design of the CRA reliability projects is recommended to be performed by MWH Americas under a new professional services agreement. Authorization of this agreement is included under a separate board action in February 2006.

Summary

This action appropriates $2.4 million; authorizes final design and all activities in advance of award of a construction contract for four CRA reliability projects; and authorizes preliminary design for two CRA reliability projects.

The estimated cost of final design of the four CRA reliability projects is $750,000. The final design cost as a percentage of the estimated total construction cost is approximately 10 percent. Engineering Services' goal for design of projects with construction costs greater than $3 million is 9 to 12 percent.

The six projects described herein have been evaluated and recommended by Metropolitan's Capital Investment Plan Evaluation Team and funds have been included in the fiscal year 2005/06 capital budget. See **Attachment 1** for the Financial Statements, and **Attachment 2** for the Location Map.

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

California Environmental Quality Act (CEQA)

CEQA determinations for Option #1:

The six proposed projects previously identified have been evaluated pursuant to CEQA and the State CEQA Guidelines. Where appropriate, the proposed projects have been grouped together by their similar CEQA determinations and discussed below.

CRA Conveyance Reliability Program (Approp. 15373)

Cast Iron Blow-Off Replacement Phase 4 - Final Design and Fabrication
Access Structure, Transition Structure, and Manhole Covers Replacement - Preliminary Design

To comply with CEQA and the State CEQA Guidelines, Metropolitan as the Lead Agency prepared in October 2001, a Mitigated Negative Declaration (MND) for the Colorado River Aqueduct Conveyance Reliability Program, 2002 Shutdown Repairs. The Board later adopted the MND and the Mitigation Monitoring and Reporting Program (MMRP) on January 8, 2002. The two proposed projects were addressed in the MND, along with subsequent modifications of those projects with the preparation of Addendum No. 2 to the MND. The Board adopted Addendum No. 2 on August 17, 2004. The present Board actions are solely based on the final design, fabrication, and related activities and not on any changes to the approved projects themselves. Hence, the previously adopted environmental documentation in conjunction with the current actions fully complies with CEQA and the State CEQA Guidelines. Accordingly, no further environmental documentation is necessary for the Board to act on with respect to the proposed actions.

The CEQA determination is: Determine that the proposed actions have been previously addressed in the adopted 2002 MND, its MMRP, and the 2004 Addendum No. 2 to the MND, and that no further environmental analysis or documentation is required.

Desert Water/Coachella Valley Service Connection Valve Replacement – Preliminary Design

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed action consists of basic data collection and resource evaluation activities, which do not result in a serious or major disturbance to an environmental resource. This may be strictly for information gathering purposes, or as part of a study leading to an action which a public agency has not yet approved, adopted, or funded. Accordingly, the proposed action qualifies as a Class 6 Categorical Exemption (Section 15306 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under a Categorical Exemption (Class 6, Section 15306 of the State CEQA Guidelines).

Aqueduct, Reservoir, and Discharge Line Isolation Gates – Preliminary and Final Design

The proposed actions are categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities involve the funding and final design of equipment as well as replacement and reconstruction of existing public facilities with negligible or no expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed actions qualify under Class 1 and Class 2 Categorical Exemptions (Sections 15301 and 15302 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the two proposed actions qualify under two Categorical Exemptions (Class 1, Section 15301 and Class 2, Section 15302 of the State CEQA Guidelines).

San Jacinto Diversion Structure and Warren Road Gates Rehabilitation - Preliminary and Final Design

The proposed actions are categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities involve the funding and final design of equipment as well as replacement and reconstruction of existing public facilities with negligible or no expansion of use and no possibility of significantly impacting the

physical environment. Accordingly, the proposed actions qualify under Class 1 and Class 2 Categorical Exemptions (Sections 15301 and 15302 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the two proposed actions qualify under two Categorical Exemptions (Class 1, Section 15301 and Class 2, Section 15302 of the State CEQA Guidelines).

CRA Pumping Plant Reliability Program (Approp. 15374)

Suction and Discharge Line Joint Repairs – Preliminary and Final Design

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall project activities involve the funding and final design of equipment as well as replacement and reconstruction of existing public facilities with negligible or no expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed action qualifies under Class 1 and Class 2 Categorical Exemptions (Sections 15301 and 15302 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under two Categorical Exemptions (Class 1, Section 15301 and Class 2, Section 15302 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

Board Options/Fiscal Impacts

Option #1

Adopt the CEQA determinations and

a. Appropriate $2.4 million in budgeted funds;
b. Authorize fabrication of pipe and fittings for Phase 4 of the cast iron blow-off replacement project; and
c. Authorize final design of four rehabilitation projects and preliminary design of two projects on the CRA.

Fiscal Impact: $2.01 million of budgeted funds under Approp. 15373 and $0.39 million of budgeted funds under Approp. 15374

Option #2

Do not proceed with the CRA rehabilitation projects. The existing conditions will be monitored and repairs will be made when problems occur.

Fiscal Impact: Unknown. Further deterioration of facilities may lead to more extensive repairs or increased costs to perform repairs.

Staff Recommendation

Option #1

Ray L. Wolfe 1/20/2006

Roy L. Wolfe *Date*
Manager, Corporate Resources

Debra C. Man 1/20/2006

Debra C. Man *Date*
Interim CEO/General Manager

Attachment 1 – Financial Statements

Attachment 2 – Location Map

BLA #4152

Financial Statement for CRA Conveyance Reliability Program

A breakdown of Board Action No. 9 for Appropriation No. 15373 is as follows:

	Previous Board Action No. 8 (Sept. 2005)	Current Board Action No. 9 (Feb. 2006)	New Total Appropriated Amount
Labor			
Studies and Investigations	$ 2,523,000	$ 89,000	$ 2,612,000
Design and Specifications	1,050,000	47,000	1,097,000
Owner Costs (Program Management, Design Review)	2,681,000	212,000	2,893,000
Construction Inspection and Support	4,485,220	0	4,485,220
Metropolitan Force Construction	5,154,870	282,000	5,436,870
Materials and Supplies	1,386,300	254,000	1,640,300
Incidental Expenses	247,400	13,000	260,400
Professional/Technical Services	1,240,000	854,000	2,094,000
Right of Way	10,000	0	10,000
Equipment Use	101,450	0	101,450
Contracts	26,571,751	0	26,571,751
Remaining Budget	3,277,009	259,000	3,536,009
Total	**$ 48,728,000**	**$ 2,010,000**	**$ 50,738,000**

Funding Request

Program Name:	Colorado River Aqueduct Conveyance Reliability Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15373	**Board Action No.:**	9
Requested Amount:	$ 2,010,000	**Capital Program No.:**	01204
Total Appropriated Amount:	$ 50,738,000	**Capital Program Page No.:**	E-17
Program Estimate:	$ 56,300,000	**Program Goal:**	I-Infrastructure Reliability

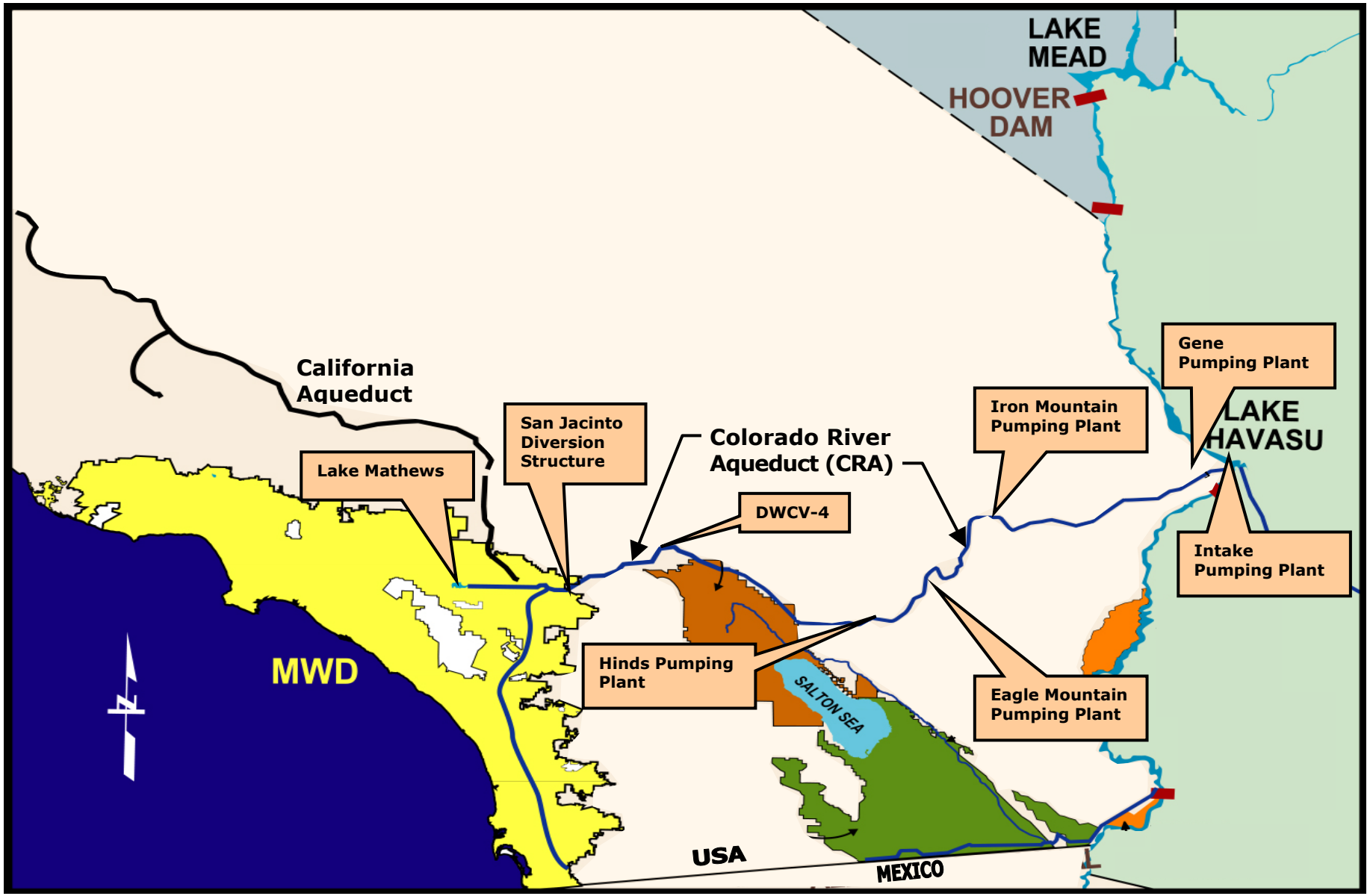
Financial Statement for CRA Pumping Plant Reliability Program

A breakdown of Board Action No. 6 for Appropriation No. 15374 is as follows:

	Previous Board Action No. 5 (Sept. 2005)	Current Board Action No. 6 (Feb. 2006)	New Total Appropriated Amount
Labor			
Studies and Investigations	$ 857,000	$ 17,000	$ 874,000
Design, Specifications and As-built	1,056,700	6,000	1,062,700
Owner Costs (Program Management, Design Review)	1,266,800	60,000	1,326,800
Construction Inspection and Support	754,800	0	754,800
Metropolitan Force Construction	2,661,500	0	2,661,500
Materials and Supplies	2,357,000	0	2,357,000
Incidental Expenses	37,800	3,000	40,800
Professional/Technical Services	30,000	252,000	282,000
Equipment Use	42,700	0	42,700
Contracts	260,000	0	260,000
Remaining Budget	1,408,700	52,000	1,460,700
Total	**$ 10,733,000**	**$ 390,000**	**$ 11,123,000**

Funding Request

Program Name:	Colorado River Aqueduct Pumping Plant Reliability Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15374	**Board Action No.:**	6
Requested Amount:	$ 390,000	**Capital Program No.:**	01204
Total Appropriated Amount:	$ 11,123,000	**Capital Program Page No.:**	E-20
Program Estimate:	$ 61,700,000	**Program Goal:**	I-Infrastructure Reliability



CRA Conveyance Reliability and Pumping Plant Reliability Projects