AID 1020-20 (10-70) — 2/27/78 - Checked Catalog Kuit Lane — REPORT U-646

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PROJECT APPRAISAL REPORT (PAR)

1. PROJECT NO.	2. PAR FOR PERIOD	3. COUNTRY	4. PAR SERIAL NO.
497-0204	Nov. 1971 TO Feb. 1977	Indonesia	77-9

4970204 (1)
PD-AAD-773-D1

5. PROJECT TITLE

Semarang Steam Powerplant

6. PROJECT DURATION	7. DATE LATEST PROP	8. DATE LATEST PIP	9. DATE PRIOR PAR
Began FY 72 Ends FY 79	N.A.	N.A.	N.A.

10p.

10. U.S. FUNDING	a. Cumulative Obligation Thru Prior FY: $	b. Current FY Estimated Budget: $	c. Estimated Budget to completion After Current FY: $
	19.7 million	--	--

11. KEY ACTION AGENTS (*Contractor, Participating Agency or Voluntary Agency*)

a. NAME	b. CONTRACT, PASA OR VOL. AG. NO.
Government of Indonesia (GOI) acting thru the State Electric Power Agency (PLN)	Loan Agreement 497-H-024
Black & Veatch International - consultant to PLN	Contract Pj/081/PST/72
Supply contracts for major powerplant equipment	12 contracts

I. NEW ACTIONS PROPOSED AND REQUESTED AS A RESULT OF THIS EVALUATION

A. ACTION (X) USAID	AID/W	HOST	B. LIST OF ACTIONS	C. PROPOSED ACTION COMPLETION DATE
			All necessary actions for project implementation have been completed, initiated or defined prior to making this evaluation. No new actions follow from this evaluation.	

DLC-974

D. REPLANNING REQUIRES REVISED OR NEW: ☐ PROP ☐ PIP ☐ PRO AG ☐ PIO/T ☐ PIO/C ☐ PIO/P

E. DATE OF MISSION REVIEW: 24 February 1977

PROJECT MANAGER: TYPED NAME, SIGNED INITIALS AND DATE		MISSION DIRECTOR: TYPED NAME, SIGNED INITIALS AND DATE	
Walter D. Lawrence	18 Feb. 1977	Thomas C. Niblock	24 Feb. 1977

Robert F. Zimmerman, Evaluation Officer

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II. PERFORMANCE OF KEY INPUTS AND ACTION AGENTS

A. INPUT OR ACTION AGENT CONTRACTOR, PARTICIPATING AGENCY OR VOLUNTARY AGENCY	B. PERFORMANCE AGAINST PLAN							C. IMPORTANCE FOR ACHIEVING PROJECT PURPOSE (X)				
	UNSATISFACTORY		SATISFACTORY			OUTSTANDING		LOW	MEDIUM			HIGH
	1	2	3	4	5	6	7	1	2	3	4	5
1. PLN - GOI Electric Power Agency				X								X
2. Black & Veatch (BVI) - consultant					X							X
3. A. Major equipment supply contractors				X								X
B. General construction contractor				X								X

Comment on key factors determining rating

No. 2 - consultant: The Black & Veatch (BVI) scope of work includes conceptual and detailed design, preparation and overall management of equipment and construction bid/contract documents, negotiation of contractual issues etc. by the Home Office. In the field, BVI is responsible for general management of the project, supervision of construction, supervision of performance testing and certification of all plant equipment prior to take over of the plant by PLN for commercial operation. Training of operators and maintenance personnel is done by both Home Office and field staff. See continuation sheet for additional comments.

	1	2	3	4	5	6	7	1	2	3	4	5
4. PARTICIPANT TRAINING						X				X		

Comment on key factors determining rating

Seventeen PLN operations and maintenance men recently completed eight months of training at the BVI Home Office, equipment manufacturer's plants and at a power plant, similar in size and sophistication to the Semarang plant, in the U.S. That group plus others will continue with on-the-job training during construction. The U.S. plus on-site training should produce qualified operations personnel.

	1	2	3	4	5	6	7	1	2	3	4	5
5. COMMODITIES												

Comment on key factors determing rating

See remarks under item 3 A on continuation sheet.

		1	2	3	4	5	6	7	1	2	3	4	5
6. COOPERATING COUNTRY	a. PERSONNEL					X							X
	b. OTHER				X								X

Comment on key factors determining rating

PLN personnel performed reasonably well and cooperated willingly with their consultant and with USAID. The two PLN officials who participated in the negotiations in Kansas City were reported as being hard and knowledgeable negotiators. The PLN personnel generally are very capable, but the PLN power development program taxes the technical and administrative capabilities severely. PLN has dealt rather well with customs in Semarang for capital equipment imports. However, there have been problems with customs clearance of re-exportable items, notably certain construction tools. Most of these problems have been resolved at the expense of considerable administrative time and effort by the consultant and the general contractor.

	1	2	3	4	5	6	7	1	2	3	4	5
7. OTHER DONORS See following notes						X						X

(See Next Page for Comments on Other Donors)

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II. 7. Continued: Comment on key factors determining rating of Other Donors

There are no outside donors other than AID on this project itself. However, the GOI has made substantial contributions to the foreign exchange requirement - some $19 million or 45% out of a total FX component of about $42 million. In total terms (FX and Rp), the GOI financial input is 68% out of a total project cost of $61,095,000 equivalent. West German credits have financed a substantial portion of the 150 KV transmission and 150/20 KV substations in Central Java, which will be integrated with the AID-financed Ketenger (Central Java) and West Java Transmission and Distribution projects.

III. KEY OUTPUT INDICATORS AND TARGETS

A. QUANTITATIVE INDICATORS FOR MAJOR OUTPUTS		TARGETS (Percentage / Rate / Amount)					
		CUMULATIVE PRIOR FY	CURRENT FY TO DATE	CURRENT FY TO END	FY 78	FY 79	END OF PROJECT
Complete installation, testing and trial operations of two generating units.	PLANNED	58	83	98	100	-	-
	ACTUAL PERFORMANCE	46	50				
	REPLANNED			75	98	100	-
Construction by AID and other donors of 150 KV transmission system connecting Central Java, West Java, and Semarang Powerplant.	PLANNED	40	50	50	60	100	-
	ACTUAL PERFORMANCE		40				
	REPLANNED			-	-	-	-
	PLANNED						
	ACTUAL PERFORMANCE						
	REPLANNED						
	PLANNED						
	ACTUAL PERFORMANCE						
	REPLANNED						

B. QUALITATIVE INDICATORS FOR MAJOR OUTPUTS	COMMENT:
1. Increased electric service reliability.	The design of the Semarang Steam Powerplant is an optimum compromise between control sophistication and operating simplicity. As such it will offer a high degree of generation reliability to the Central Java system which currently is a loosely interconnected system of small generating units.
2. Maximum efficiency and minimum cost generation.	When generation units of over 25 megawatts are needed on a power system, steam units are the most practical and overall the most economical of the different types of thermal generation.
3. N.A.	

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IV. PROJECT PURPOSE

A. 1. Statement of purpose as currently envisaged. 2. Same as in PROP? ☐ YES ☐ NO

The Semarang Steam Powerplant will add 100 megawatts of modern and efficient electrical generating capacity to the existing 100 megawatts of State Electricity Authority (PLN) capacity, much of which has served out its useful life. The new plant will provide an assured supply of electrical energy to approximately 240,000 existing customers and some 25,000 new customers per year for several years. Load growth thereafter will be assigned to contemplated additions to the Semarang Powerplant. Site space, cooling water provisions and the oil line can serve up to 600 MW.

B. 1. Conditions which will exist when above purpose is achieved.	2. Evidence to date of progress toward these conditions.
Semarang Steam Powerplant is a key feature in the long-term electric energy supply for Central Java. Obsolescent and inefficient generating units will be retired and the interim generation (gas turbine unit at Semarang and diesel units at Yogyakarta) will revert to peaking operation as system conditions allow.	Most of the major equipment has been delivered to the site. All site preparation work is complete and most of the equipment foundations are in place. Most of the powerplant building structural steel is erected, turbine-generator piers are ready for assembly of the units, condensers are in place and boiler No. 1 will be ready for hydrostatic testing by August 1977.

V. PROGRAMMING GOAL

A. Statement of Programming Goal

The electric power sector goal is to provide additional electric service to existing customers and to connect as many new customers as possible. In working toward that goal, PLN is adding to their generation, transmission and distribution plants as rapidly as financial, manpower and other resources allow.

B. Will the achievement of the project purpose make a significant contribution to the programming goal, given the magnitude of the national problem? Cite evidence.

The Semarang Steam Powerplant is a key element in the electric power supply picture for Central Java since it will double the present capability. Furthermore, it will enable much of the existing inefficient and high cost generation to be retired or put on stand-by thereby reducing the cost to PLN of energy production. This in turn will enable PLN to invest more in improved and expanded distribution, benefiting more customers. It also will enable PLN to increase the allocations of power to existing customers, many of whom are on current limited type of service where the supply trips off when the limit is exceeded, a restriction necessitated by the present inadequate generation and distribution plant facilities.

No. 2 - consultant (contd.): Design and bid/contract work was well done by BVI and they cooperated willingly and effectively with USAID in complying with the complex and bureaucratic AID procurement regulations. Early in 1974, it was necessary to negotiate many of the major equipment supply contracts due to the very fluid prices of energy and basic commodities (copper, steel, etc.) which raised prices and extended delivery periods of the major equipment items. This work was effectively done in the BVI Kansas City office with PLN participation and AID monitoring.

BVI has a competent and experienced field staff and is providing effective construction supervision and client representation. The BVI monthly and quarterly progress reports are some of the best provided to the Mission.

No. 3 A - Major equipment supply contracts: The AID loan finances FX costs of 12 equipment contracts and consultant engineering services. FX not financed by the AID loan and consequently COI financed include the general construction contract, the submarine oil pipeline, the crane and hoist and structural steel. Manufacture and delivery of the major equipment has been generally satisfactory. In some cases, such as the condensers, poor preparation for marine shipping has caused equipment damage, but so far this has had no major impact on project construction progress. Most supply contracts include a supplier technical representative on site during installation work.

No. 3 B - General Construction Contractor: This work is being done by MWK/Black, a joint venture. MWK, a Seattle firm with Asia offices in Hongkong has done many creditable jobs for AID financed projects in other countries and their scope of work on this project includes installation of PLN procured major equipment, supply and installation of auxiliary equipment, piping, valves and initial operation of the plant. The contract was signed in September 1975, installation of equipment started in December 1975 and firing of the first unit is predicted for December 1977. See copy of AID PPT document for further details on construction and operation events and background of time delays in the early phases of the project. MWK has requested a time extension on their work schedule of 158 days which BVI has recommended and PLN/Project has approved. PLN headquarters as of late February 1977 was considering the proposal and approval is expected. The main reasons for MWK not being able to get started on schedule are delays in site preparation, delays in pile driving due to much deeper piles being required and some initial survey errors which required corrections to some foundations.

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Continued Relevance of Current Project Purpose:

1. Are there alternative approaches to achieving this Project's Purpose or the Sector Goal? Would any other approach be more effective or appropriate for USAID?

There are no alternatives to building a powerplant if you require electric power. The only other alternatives are the type of powerplant - in this case hydro, diesel, gas turbine or nuclear. Hydro sites are being developed in Indonesia to complement thermal - not as alternatives. The long-term operating costs of gas turbines are higher than steam and diesels are inherently too small. Nuclear is only a long-term future mode of generation in Indonesia.

2. What is current priority of Project with the GOI? Evidence for or against?

This is a high priority project with the GOI. The Central Java system will need not only this project capacity, but will continue with additions to the plant and preliminary plans and financing are now in view.

Evidence of the high priority for this project is the high ratio of GOI FX financing (see PAR page 3).

3. How does GOI view USAID role? Do USAID and GOI share common perception of Project Purpose?

The GOI views AID bureaucracy in procurement procedures and regulations with some amazement. However, once all the standard requirements and provisions were put into the equipment bid/contract documents and were accepted (if not fully appreciated) by PLN, procurement went reasonably smoothly.

USAID and GOI do indeed share a common perception of the project purpose which is to provide a key source of electrical generation for the Central Java area and to bring electric service to as many people as possible at the lowest possible cost.

4. Are there adverse side effects to this Project?

a. Economic?
Economic aspects of this project are positive in the sense of providing employment for many hundreds of workers.

b. Ecological?
An oil burning thermal plant is inherently a relatively low contributor to air pollution.

c. Social/Political?
None.

d. Health?
Air pollution is minimal. Thermal pollution is minimal due to the dispersion that the cooling water outflow will have into the sea.

5. Do the benefits justify the costs?

The direct benefits of the Semarang Powerplant are the revenues earned by PLN from sales of the energy produced. Under terms of covenants executed by PLN with foreign donors to the power sector, PLN is required to establish energy tariffs sufficient to meet its operating expenses and to finance a reasonable portion of its capital plant. The indirect benefits of electric energy (from Semarang or any other source) are many and widespread, both social and economic. Social benefits include better standards of living, improved health and sanitation and recreation. Electric service is necessary to practically any type of commercial and industrial enterprise.

6. Are there any benefits not directly related to project purposes?

The local currency component of total project cost is almost $19 million equivalent - for local civil works contracts, local skilled, semi-skilled and common labor and many other supporting workers. All this money went into the local economy in one way or another. Also, many men were trained on special crafts - welding, pipe fitting etc. Those and many other men with up-graded skills will contribute to other industrial development in Indonesia.

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7. Overall Assessment of Project Performance.

Unsatisfactory		Satisfactory			Outstanding	
1	2	3	4	5	6	7
			X			

The above rating means that the project is being done in an entirely satisfactory manner. To be outstanding, the project would have be well ahead of schedule or show some other extra-ordinary accomplishment.

COUNTRY	PROJECT NO.	PROJECT TITLE	DATE		APPROVED
Indonesia	497-0204	Semarang Steam Power Station	15 Feb. 77	[X] ORIGINAL REVISION # 1	

PROJECT PURPOSE (FROM PRP FACESHEET)

As stated in the Capital Assistance Paper, the purpose of this project is to provide an increase in power generation for Central Java sufficient to meet the project loan growth from 1975 when operation begins through 1981 when additional power units are scheduled.

CPI DESCRIPTION

More explicitly, the Semarang Steam Powerplant will add 100 MW of modern and efficient generating capacity to the existing 100 MW of State Electricity Authority (PLN) capacity (much of which has served its useful life). The loan was authorized in June 1971, the loan agreement signed in November 1971, the consultant services contract signed in September 1972 and the consultant was at site by March 1973 at which time procurement of the major equipment was started. When the project cost was up-dated at that time, it was determined that the loan amount of $19.7 million was insufficient to cover total FX costs. By the time a supplemental loan requests was presented to the DLC for authorization, costs had escalated still further and rather than add to the supplemental loan, AID/W rejected both supplemental loan requests and the GOI was requested to provide the additional FX. The GOI made a commitment to provide the additional FX by August 1974 and meanwhile procurement of the major equipment (AID loan financed) proceeded. GOI provided FX is primarily for the general construction contract and the submarine oil pipeline.

1. Prior actions: Equipment and material mostly at site. Installation started December 1975. General construction contractor has requested 158 days extension of their completion commitment which has been recommended by the consultant, approved by PLN/project and is expected to be approved by PLN headquarters. As of February 1977, project is 50 percent complete.

2. Start construction of submarine fuel oil pipeline. Contract signed 8 February 1977; completion scheduled February 1978. The pipeline will bring heavy residual fuel oil from off-shore tanker unloading facilities to main storage tanks. Action agent - GOI financed contractor.

3. July 1977 - provide additional financing for consultant services time overrun. Action agent GOI.

4. December 1977. Fire Unit 1 - boiler tests complete and turbine-generator No. 1 turned first time. Fuel for start-up will be trucked to the site. Action agent - general construction contractor.

5. February 1978 - submarine oil pipeline completed by contractor.

6. April 1978 - complete tests on Unit No. 1. Action agents - construction contractor, technical representative and consultant.

7. April 1978 - same as item 4 above for Unit No. 2.

8. June 1978 - PLN take over operation of Unit No. 1.

9. July 1978 - same as item 6 for Unit No. 2.

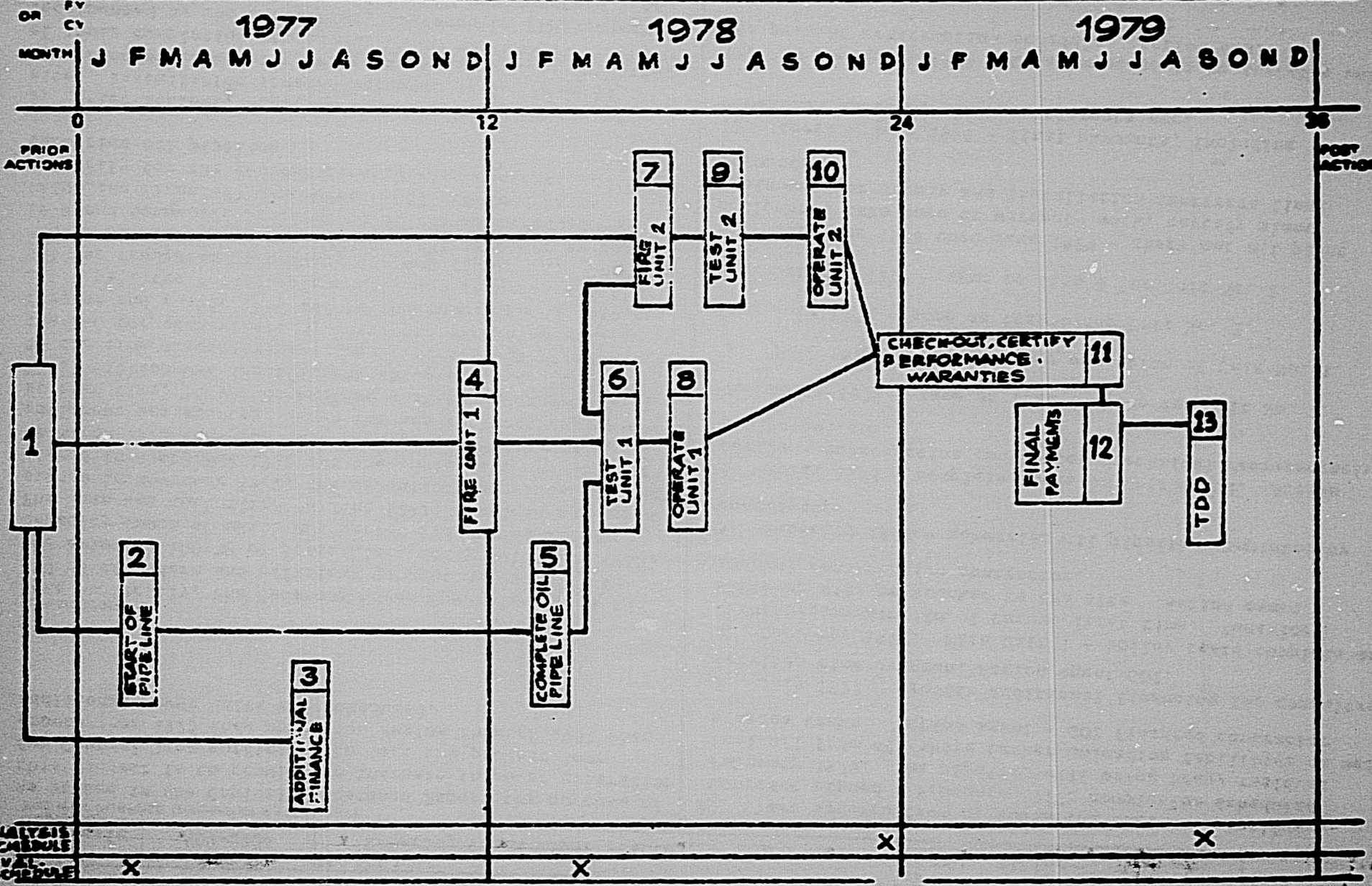
10. October 1978 - same as item 8 for Unit No. 2.

11. December 1978 thru June 1979 - check out all plant equipment, take care of warranty work, certify plant equipment for supply and installation contracts final payments.

12. April - June 1979 - final payments, including retention amounts, claim settlements etc.

13. 30 September 1979 TDD is expected to be suitable under the present construction schedule. Action AID.

COUNTRY	PROJECT NO.	PROJECT TITLE	DATE	☐ ORIGINAL ☐ REVISION # ____	APPROVED



CRITICAL PERFORMANCE INDICATOR (CPI) NETWORK

AID 1020-35 (6-76)