

Engineering Procedure

SAEP-329

23 November 2005

Project Close-Out Report

Document Responsibility: Project Support and Controls Dept.

Saudi Aramco DeskTop Standards

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I Scope

This procedure provides detailed instructions and establishes responsibilities for the preparation of Project Close Out Reports. The purpose of these reports is to provide comprehensive historical project information addressing all project phases. This information will benefit Project Management in planning and executing future projects.

The preparation and submittal of Project Close Out Reports, in accordance with this procedure, is required for all projects with an Expenditure Request (ER) value of \$20 million, or greater. Projects with an ER value of \$50 million or greater will also conduct a Post Project Appraisal Meeting chaired by the responsible Project Management Department Head in accordance with Section 7 below. Projects with an ER value less than \$20 million will prepare an abbreviated report containing, as a minimum, Lessons Learned as specified in Section 6.5 below.

In addition PS&CD will arrange for meetings with Project Managers to discuss project close out information and share their experience. These meetings are intended to ensure consistency in data collection and to increase understanding of best practices, successes and lessons learned. This will enhance the potential to apply these lessons to other projects.

Exception:

Maintain Potential projects and Third Party projects are excluded from the requirements of this procedure.

II Applicable Documents

The requirements contained in the following documents and forms apply, to the extent specified in this procedure.

Saudi Aramco Documents

Cost Manual

Planning and Scheduling Manual

GI-0020.520-1, "Instructions for Preparing a Project Change Request"

Projects Documents

Expenditure Request

Project Execution Plan

Change Order Log

Project Change Request Log

Direct Charge Material Status Report

Waiver Log

III Instructions

Prepare the Project Close Out Report following these guidelines and instructions. The reports shall be prepared in electronic format by filling in the templates contained in Attachments 1, 2, and 3. Submit the completed report (electronic copy) to the Supervisor, Cost Engineering Unit of the Project Support and Controls Department. The Preliminary Engineering data is to be issued within 3 months after ERA. The remaining Project Execution information is issued within 2 months after Onstream. If required an addendum should be issued at ERC which would address the final cost information and any other pertinent information which occurred between Onstream and ERC.

The data should be in electronic format utilizing MS Word and Excel.

The following instructions are numbered to match the corresponding sections and paragraphs found in the Attachment 1, 2 and 3 templates.

1. Executive Summary (See Attachment 1)
 - 1.1 Project Description/Approved Expenditure Request

Attach electronic copy of the project approved Expenditure Request package.
 - 1.2 Project Execution Plan

Attach electronic copy of the approved Project Execution Plan.
 - 1.3 Project Change Request (PCR) Log

Attach electronic copy of the PCR Log. Include reason(s) for each PCR per list of reasons in GI-0020.520-1, "Instructions for Preparing a Project Change Request".
2. Preliminary Engineering (See Attachment 2)
 - 2.1 Cost
 - 2.1.1 PMT - Preliminary Engineering

Represents the total Project Management Team cost associated with the Preliminary Engineering effort. The cost should include Saudi Aramco labor, relocation cost, uplifts at foreign

locations, vehicles, business trips CTS/MTS charges, and other associated PMT costs.

IK and OOK costs must be kept separate. PMT's should have segregated the Preliminary Engineering costs utilizing the 01X tertiary phases for Project Proposal (In-Kingdom) and phase 02X tertiary phases for Project Proposal (Out-of-Kingdom).

For OOK locations PMT should indicate the work location and include total man-months associated with the above costs to be able to determine an average cost per man-months or equivalent man-months for the preliminary engineering location.

2.1.2 Contractor - Preliminary Engineering

Represents the Preliminary Engineering contractors name or the PMC contractor, if they are performing the Preliminary Engineering effort, work location and the total engineering contractor cost associated with the Project Proposal effort. The cost should include, labor, relocation uplifts at foreign locations, vehicles and other associated costs.

A copy of the final Proposal Engineering Statistics (PES) report should be attached. If the PES report is not included the total project proposal man-hours should be included to determine average cost per man-hour.

2.1.3 Preliminary Engineering - Miscellaneous

Represents all other miscellaneous Preliminary Engineering costs not included above i.e. site investigation, survey, license agreements, etc.

2.2 Schedule

2.2.1 Preliminary Engineering Duration

Shows Project Proposal duration from Project Proposal Start date (Project Proposal Contract Award / Service Order Award) to Project Proposal Approval date.

2.2.2 Key Project Milestones

- Provide actual milestone dates for the following milestones:

- DBSP Approval
- Preliminary Engineering Start
- Interim Design Review
- Technical Review
- Project Proposal Approval
- ERA

3. Detail Engineering (See Attachment 2)

Prepare a separate spreadsheet for each Design Engineering Contractor/
Contractor location.

3.1 Cost

3.1.1 PMT - Detail Engineering

Represents the total Project Management Team cost associated with the Detail Engineering effort. The cost should include Saudi Aramco labor, relocation cost, uplifts at foreign locations, vehicles, business trips CTS/MTS charges, and other associated PMT costs. PMC associated cost and man-hours in support of PMT at the contractors design office should be identified separately.

IK and OOK costs must be kept separate. PMT's should have segregated the Detail Design costs utilizing the 03X tertiary phases for Detail Design (In-Kingdom) and phase 04X for Detail Design (Out-of-Kingdom)

For OOK locations PMT should indicate the work location and include total man-months associated with the above costs to be able to determine an average cost per man-months or equivalent man-months for the design engineering location.

3.1.2 Contractor - Detail Engineering

Represents the name of the contractor, work location and the total Detail Engineering contractor cost associated with the Detail Engineering effort. The cost should include, labor, relocation uplifts at foreign locations, vehicles and other associated costs.

A copy of the final Design Engineering Statistics (DES) report should be attached if available. If the DES report is not included the total Detail Engineering man-hours should be included to determine average cost per man-hour. This is not applicable to LSTK & LSPB.

3.1.3 Project Management Contract (PMC)

Total PMC Management related cost including labor, vehicles, business trips and other associated PMC charges for the Project by PMC contractor in support of the SAPMT during the construction phase.

The report should also include the number of contractor man-hours associated with the above charges to be able to develop an average hourly rate.

3.1.4 Detail Engineering - Miscellaneous

Represents all other miscellaneous Detail Engineering costs not included above.

3.2 Schedule

3.2.1 Key Project Milestones

Provide actual milestone dates for the following milestones:

- Detail Design Contract / Service Order Award
- Major Contract(s) issued for bid
- Major Contract(s) Awarded
- Engineering Start
- Design Reviews
- First Long Lead P.O. Issued
- Last Long Lead P.O. Delivered
- Completion of all IFC's / Specifications & Standards
- Construction Contract Award
- Construction Start
- Hydrotest Start & Finish
- Loop Check Start & Finish

- Mechanical Completion
- Onstream

3.2.2 Actual Progress

Provide the actual progress percentages for engineering, material procurement & construction (see responsibility matrix).

3.2.3 Man-hours Histogram for Engineering

Provide actual incremental man-hours histogram for the engineering for each contract/contractor location.

3.2.4 CPM Schedule

Provide electronic copies of CPM work schedules:

- Original approved schedule
- Approved revised baseline schedules, as applicable
- Last updated schedule

3.3 Change Orders

Attach Change Order Log for each long form contract (electronic copy).

- Select category of reason for change orders from the attached list in Template Attachment 2 and provide number of change orders falling in that category and total value.
- Identify how many change orders had schedule impact on the contract completion date and what was the total schedule impact in months.

4. Material (See Attachment 2)

4.1 Cost

4.1.1 Direct Charge

Reflects the total material costs for Direct Charge material booked to the project accounts. For each equipment item with a unit value greater than \$250,000, attach selected vendor's final purchase order pricing data and equipment spec sheets.

4.1.2 SAMS Material Charges

Reflects the total material costs for SAMS material booked to the project accounts.

4.1.3 Contractor Supplied Material

Reflects the total contractor supplied material costs booked to the project accounts. PMT should have segregated the contractor supplied material utilizing the appropriate entry code 318, 319 and/or 320.

Commentary Note:

(If the Contractor Supplied material information is not available, then it is not required to provide input for this item.)

4.2 Schedule

Engineered material / equipment duration (Long Lead)

Attach electronic copy of the latest D/C material status report.

5. Construction (See Attachment 2)

5.1 PMT Cost

5.1.1 PMT Cost

Total Saudi Aramco Project Management Team costs including Saudi Aramco labor, CTS/MTS charges, vehicles, aircraft business trips and other associated PMT charges for the Project.

5.1.2 Project Management Contract (PMC)

Total PMC Management related cost including labor, vehicles, business trips and other associated PMC charges for the Project by PMC contractor in support of the SAPMT during the construction phase. The cost should be segregated by nationality as indicated on the attachment.

The report should also include the number of contractor man-hours associated with the above charges to be able to develop an average hourly rate.

5.1.3 Other Miscellaneous Costs

All other miscellaneous costs not identified above.

5.1.4 Inspection

Reflects the total Saudi Aramco Inspection cost, Aramcons and the contracted inspection cost, in-lieu of Aramcons and booked to the project accounts. SAPMT should have segregated the Saudi Aramco inspection costs utilizing the 09X tertiary phases.

5.2 Construction Contractor Cost & Man-hours Histogram

- Provide information about the contract number, contractor's name, contract initial value, total change orders value, total amendments value & contract final value.
- Provide Bid Technical Proposal and Actual incremental man-hours histogram for the construction for each contract.
- A separate attachment should be prepared for each major contractor.

5.3 Change Orders

Attach Change Order Log for each long form contract (electronic copy).

- Select category of reason for change orders from the attached list in Template Attachment 2 and provide number of change orders falling in that category and total value.
- Identify how many change orders had schedule impact on the contract completion date and what was the total schedule impact in months.

5.4 Commissioning

Commissioning & Start-up Problems

BI number, commissioning activity, statement of problem, statement of resolution, recommendations to avoid problem in future. Include comments on manpower availability (vendor, proponent, commissioning team) and test equipment or material problems.

6. General (See Attachment 3)

Note that this section applies to both the Project Proposal and Final issues of the close-out report.

6.1 Achievements & Success

Briefly address any achievements and successes experienced by the project.

6.2 Project Performance

Briefly describe the project accomplishments and compare to:

- Initial scope
- Original cost & schedule

In addition, address the following, as applicable:

- Special project execution techniques
- Major deficiencies, if any

6.3 Contractor Performance

- Provide copy of final Performance Evaluation Report for each contractor (Project Proposal Contractor, Detail Engineering Contractor, Construction Contractor, & Project Management Contractor).
- Provide copy of PMT evaluation of detailed design contractor at 90% construction stage.
- In addition, include a narrative to address each contractor's final performance in schedule, cost, quality, and safety as viewed from the PMT's end-of-project perspective.

6.4 Best Practices Implementation

Briefly address any achievements and/or experiences by the project in implementing best practices. Document which best practices were used, benefits realized (cost, schedule, quality, etc.), and lessons learned during the implementation process. Address the following, as applicable:

- Pre-project Planning and Project Definition Rating Index (PDRI). Include scoresheets from PDRI scoring exercises.

- Scope Definition & Control + Change Management
- Constructability. Include final constructability log.
- Schedule Optimization
- Planning for Startup
- Value Engineering
- Benchmarking. Include benchmarking report.
- Other best practices

6.5 Lessons Learned

As new lessons are learned in all phases of the project, the lessons should be entered into Project Management's Lessons Learned database. When the Project Close-out Report is compiled, the lessons used from the database as well as lessons entered into the database should be inserted.

Address Lessons Learned when they arise in each phase of the project. Additional Lessons Learned may be generated when considering:

- Reasons for contract type: Whether it proved to be the most appropriate method or not.
- Safety performance.
- PMT's relationship with other organizations.
- Proponent support.
- Mobilization & demobilization problems.
- Delays & schedule slippage.
- Claims: Discuss reasons for claims and any measures that could have been taken to prevent or defend against a claim.
- Custom duties: Problems incurred.
- Other items.

6.6 Waivers

Provide electronic copy of the waivers log.

6.7 Geotechnical Report Summary

Provide copy of geotechnical report summary.

7. Post Project Appraisal Meeting

Projects with an ER value of \$50 million or greater will conduct a Post Project Appraisal Meeting chaired by the responsible Project Management Department Head. The timing of the meeting will support the requirement to issue the close out report within 2 months after Onstream. The purpose of the meeting is to identify and record lessons learned that could be used to improve the planning and execution of future projects.

Participants in the meeting will include:

- Proponent Operations Manager
- Maintenance Superintendent
- Commissioning Team Leader
- SAPMT
- Representatives from other concerned organizations as appropriate

The meeting will address the following subjects, as a minimum:

- Contracting strategy (type of contracts)
- Execution of contracting plan
- Selection of contractors (engineering and construction)
- Contractor performance
- Material procurement strategy
- Manning of the project (size of team, discipline mix, etc.)
- Interface with Proponent
- Planning for commissioning and start-up
- QA/QC compliance
- Safety performance
- Expected facility performance after startup
- Use of value improving practices
- Other items deemed useful for improving planning and execution of future projects

Meeting minutes will be prepared and included with the close out report.

IV Responsibility

- The Project Manager is responsible for the issuing information per Table 1.
- PS&CD/PCD is responsible for issuing information per Table 1.

Revision Summary

23 November 2005

Revised the "Next Planned Update". Reaffirmed the contents of the document, and reissued with no other changes.

Table 1 – Responsibility Matrix

Data	Responsibility	Data Source
1. Executive Summary 1.1 Project Description/ER Approval Package 1.2 Project Execution Plan 1.3 Project Change Request (PCR) Log	PMT/PS&CD PMT PMT	ER Package/FPD PEP PCR Log
2. Preliminary Engineering 2.1 Cost 2.1.1 PMT – Preliminary Engineering 2.1.2 Contractor – Preliminary Engineering 2.1.3 Preliminary Engineering – Miscellaneous 2.2 Schedule 2.2.1 Preliminary Engineering Duration	PMT PMT PMT PMT	PPU Rack-up PPU Rack-up PPU Rack-up P.P. Schedule
3. Detail Engineering 3.1 Cost 3.1.1 PMT- Detail Engineering 3.1.2 Contractor - Detail Engineering 3.1.3 Project Management Contract (PMC) 3.1.4 Detail Engineering – Miscellaneous 3.2 Schedule 3.2.1 Actual Progress 3.2.2 Key Project Milestones 3.2.3 Man-hours Histogram for Engineering 3.2.4 CPM Schedule (electronic copy) 3.3 Change Orders	PMT PMT PMT PMT PS&CD/PCD/PICU-SEU PMT PMT PMT PMT	MPU Rack-up MPU Rack-up MPU Rack-up MPU Rack-up PMIS Project Schedule Contractor Report CPM Work Schedule Change Order Log
4. Material 4.1 Cost 4.1.1a Direct Charge 4.1.2b DC Cost Data & Spec Sheets 4.1.2 SAMS Material Charges 4.1.3 Contractor Supplied Material 4.2 Schedule 4.2.1 Engineered Material/Equipment Duration	PS&CD/PCD/CEU PMT PS&CD/PCD/CEU PS&CD/PCD/CEU PMT	ACAC-06 Project Material Files ACAC-06 ACAC-11 D/C Matl Status Report
5. Construction 5.1 PMT Cost 5.1.1 PMT Cost 5.1.2 Project Management Contract (PMC) 5.1.3 Other Miscellaneous Costs 5.1.4 Inspection 5.2 Contractor Cost & Man-hours Histogram 5.3 Change Orders 5.4 Commissioning & Start-up Problems	PMT PMT PMT PMT PMT PMT PMT PMT	MPU Rack-up MPU Rack-up MPU Rack-up MPU Rack-up MPU Rack-up Contractor Report Change Order Log
6. General 6.1 Achievements & Success 6.2 Project Performance 6.3 Contractor Performance 6.4 Best Practices Implementation 6.5 Lessons Learned 6.6 Waivers 6.7 Geotechnical Report Summary	PMT PMT PMT PMT PMT PMT PMT	
7. Post Project Appraisal Meeting	PMT	

Attachments for SAEP-329

Attachment 1 – Executive Summary Template

- Double click here to open => [SAEP-329A1](#) for Attachment 1.

Attachment 2 – Cost and Schedule Template

- Preliminary Engineering
 - Detail Engineering
 - Material
 - Construction
- Double click here to open => [SAEP-329A2](#) for Attachment 2.

Attachment 3 – General Template

- Double click here to open => [SAEP-329A3](#) for Attachment 3.
- To obtain a hardcopy of the attachments contact the Standards Coordinator, Engineering Services.