

SAUDI ARABIAN OIL COMPANY (Saudi Aramco)		G. I. NO. Approved 405.005	
GENERAL INSTRUCTION MANUAL		ISSUE DATE 8/4/2007	REPLACES 02/12/2005
ISSUING ORG.	PROCESS & CONTROL SYSTEMS DEPARTMENT	APPROVAL V.P., E.S.	PAGE NO. 1 OF 7
SUBJECT	ROYALTY MEASUREMENT FACILITY RESPONSIBILITIES		

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1.0 SCOPE

This General Instruction (GI) describes the role, responsibilities, and procedures to be followed by Saudi Aramco in general, and some of its departments in all matters pertaining to the design and operation of royalty measurement facilities (including metering and tank gauging) for hydrocarbon liquids. These measurement performed at these systems are used as the basis for paying royalty to the Saudi Arabian Government.

In accordance with the Accounting Instruction Manual 809, the following applications are royalty transfer measurement type:

- Crude oil pipelines deliveries to Refineries, local customers such as Power Plants and loaded from Export terminals. The crude oil supplied from refineries to local customers are not considered royalty
- Propane, Butane, Natural Gasoline and heavier refined products produced by Refineries or Gas Plants delivered to local customers or export terminals

2.0 OBJECTIVE

The objective of this GI is to provide uniformity of approach in the design, operation and maintenance of measurement facilities, ensure that associated methods are consistent throughout the Company, and that both the Company and MINPET requirements are fully satisfied.

For any clarification and interpretation of this GI, consult P&CSD/PID/Custody Measurement Unit

3.0 REFERENCES

3.1 STANDARDS

- 3.1.1 SAES-Y-103 Royalty/Custody Metering of Hydrocarbon Liquids,
- 3.1.2 API Manual of Petroleum Measurement Standards

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3.2 PROCEDURES

- 3.2.1 SAEP-21 Project Execution Requirements for Saudi Aramco Royalty/Custody Metering Systems (For Saudi Aramco facilities)
- 3.2.2 SAEP-50 Project Execution Requirements for Third Party Royalty/Custody Metering Systems (For royalty metering facilities that are owned, designed and installed by a third party, but to be operated by Saudi Aramco.)

3.3 GENERAL INSTRUCTIONS

- 3.3.1 GI-405.004 Royalty/Custody Measurement of Hydrocarbon Liquids using Upright Cylindrical Tanks
- 3.3.2 GI-405.007 Royalty Measurement of Hydrocarbon Liquids

3.4 ACCOUNTING INSTRUCTION MANUAL

- AIM 809 Accounting For Royalties

4.0 RESPONSIBILITIES

4.1 SAUDI ARAMCO – GENERAL

The royalty measurement/metering systems shall be operated and maintained by Saudi Aramco. However, some of activities can be assigned to an outside agency under the direct supervision and responsibility of the assigned Operating department shall

- 4.1.1 Designate a Proponent Organization that is responsible for operation and maintenance of royalty measurement/metering stations. This Organization is named “Operating Organization” hereafter
- 4.1.2 Provide measurement facilities in accordance with MINPET requirements and the above-mentioned primary references.
- 4.1.3 Ensure that procedure to be followed in the administration of any Saudi Aramco and third party measurement project shall be in accordance with the provisions of the applicable primary engineering procedures listed above.

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- 4.1.4 On new or modified royalty metering projects, furnish MINPET with all major and relevant information concerning the facility at the earliest possible time, consistent with the overall project schedule.

4.2 SAUDI ARAMCO DEPARTMENTS

4.2.1 OPERATING ORGANIZATIONS

Any department having operational responsibility for a measurement facility shall, in addition to normal facility operating responsibilities, be responsible for the following:

- 4.2.1.1 Fulfill the requirements and responsibilities assigned to the Operating Organization for executing metering systems outlined in SAEP-21 and SAEP-50, as applicable.
- 4.2.1.2 Assigning a knowledgeable and competent engineer to work closely with metering station staff and provide first level assistance to day-to-day metering activities. He will be acting as focal contact person with P&CSD. The Operating Organization with P&CSD/CMU will, jointly, develop the roles and responsibilities of the local measurement engineer.
- 4.2.1.3 Maintain well-trained workforce to operate and maintain the measurement systems in accordance with the system instruction manual and GI 405.007. The operating Organizations, jointly with P&CSD, should develop and provide the required training program for the metering workforce.
- 4.2.1.4 Ensure that the intent and provisions of this instruction are followed in an expeditious manner.
- 4.2.1.5 Initiate contacts with Process & Control Systems Department (P&CSD) and/or Saudi Aramco Affairs Department, as required, to implement this instruction.
- 4.2.1.6 Request local MINPET representative to witness and approve the day-to-day metering activities under his responsibility
- 4.2.1.7 Obtain P&CSD's technical assistance for non-routine activities such as meter calibration, prover calibration, sampler



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performance test, or troubleshooting of the measurement system.

- 4.2.1.8 Notify P&CSD as soon as practicable, of any technical disagreement may arise in the course of normal operations which cannot be resolved at the local metering engineer and MINPET representative level.
- 4.2.1.9 Develop instruction manuals pertaining to the operation and maintenance of the measurement systems.
- 4.2.1.10 Refer all new or revised instructions manuals pertaining to the measurement systems to the concerned Organizations for review before submitting them to P&CSD for technical review and concurrence before issuance.
- 4.2.1.11 Review Operation Instruction Manuals every three years and revise, if necessary
- 4.2.1.12 In conjunction with P&CSD, ensure the soundness of every facility design and its operating instructions in accordance with GI and facility operation Instructions.

4.2.2 SAUDI ARAMCO AFFAIRS DEPARTMENT

Saudi Aramco Affairs has the overall responsibility for:

- 4.2.2.1 All official correspondences with MINPET on measurement matters.
- 4.2.2.2 Handling all contacts with MINPET on matters pertaining to measurement. This includes, but not limited to, various activities such as arranging meetings, and handling of documents for review, translation, or transmittal.
- 4.2.2.3 Through its Government Liaison Engineer, interfacing with MINPET representatives on other general functions like field trips, metering system functional tests, etc.
- 4.2.2.4 Providing all necessary arrangements that enable MINPET personnel to participate in the activities within their responsibilities detailed in the referenced documents. These arrangements shall be, but not limited to, travel arrangement,

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accommodations, expenses on transportation and visa acquirement.

4.2.3 PROCESS & CONTROL SYSTEMS DEPARTMENT (P&CSD)

Commentary Note: Specifically, the Custody Measurement Unit (CMU) of Process Instrumentation Division (PID).

- 4.2.3.1 P&CSD has the primary responsibility of ensuring that the technical aspects of all measurement facilities are consistent with applicable MINPET, Saudi Aramco and referenced Industry standards.
- 4.2.3.2 Shall provide technical guidance to all concerned, to implement this instruction, and shall be the controlling agency for same.
- 4.2.3.3 Jointly with the Operating Organization, develop and provide the required training program for the metering workforce
- 4.2.3.4 Has overall responsibility to ensure that a consistent approach to the design and operation of a measurement system is maintained throughout the Company.
- 4.2.3.5 In designing new measurement facilities, P&CSD shall be responsible for:
 - 4.2.3.5.1 Fulfilling the requirements and responsibilities assigned to P&CSD for executing metering systems outlined in SAEP-21 and SAEP-50, as applicable.
 - 4.2.3.5.2 Notifying MINPET on project scope, and where any appreciable departure from past measurement practices are involved. This step shall be accomplished during the design phase as outlined in SAEP-21, or SAEP-50, as applicable.
 - 4.2.3.5.3 Assisting and/or guiding the Operating Organizations in reviewing the operating instructions for the new measurement facilities.
- 4.2.3.6 On existing measurement facilities, P&CSD has the following responsibilities:



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- 4.2.3.6.1 Reviewing the results and associated documents obtained from the Operating Organizations of conducting non-routine activities such as calibration of meters, provers, performing water injection tests on automatic oil samplers before submitting them to MINPET, for formal notification and/or official approval.
- 4.2.3.6.2 Storing and maintaining certified test measures (tank provers) in good condition, and ensuring that the certification and integrity of the test measures and accessories remain valid.
- 4.2.3.6.3 Proposing needed modifications to existing facilities, and preparing associated documentation for submittal to MINPET. These modifications shall be technically documented and detailed for project submission
- 4.2.3.6.4 Review and Proposing needed modifications to operating instructions
- 4.2.3.6.5 Through its Technical Director, Custody Measurement Unit/ PID/P&CSD, providing primary liaison for technical support with MINPET.
- 4.2.3.6.6 Conducting Measurement Surveys periodically not exceeding 5 years, making recommendations to Operating Organizations and following them up with the Operating Organization per G.I. 405.007



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5.0 CONCURRENCE/APPROVAL AUTHORITY

RECOMMENDED BY:

Manager, Process & Control Systems Department

Date: _____

CONCURRED:

Vice President, Refining

Date: _____

Executive Director, Distribution & Terminal Operations

Date: _____

Vice President, Abqaiq Plants, Power & Pipelines

Date: _____

Vice President, Northern Area Gas Operation

Date: _____

Vice President, Northern Area Oil Operations

Date: _____

Vice President, Saudi Aramco Affairs

Date: _____

APPROVED BY:

Vice President, Engineering Services

Date: _____

