

Use of Subsea Wet-gas Flowmeters in Allocation Measurement Systems

API RECOMMENDED PRACTICE 85
FIRST EDITION, AUGUST 2003

REAFFIRMED, OCTOBER 2013



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Upstream Segment

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FOREWORD

This Recommended Practice is under the jurisdiction of the API Executive Committee on Drilling and Production Operations. It is intended to advise the user on various aspects of the use of subsea wet-gas flowmeters in allocation measurement systems. Marinization, operation, abnormal operation, and meter testing are important topics included here, but, foremost, this document proposes novel techniques to be used in the allocation of total production to individual contributing streams.

Deepwater oil and gas prospects often employ a form of development known as a subsea tie-back. In these applications, wells are completed subsea, and production flows to host facilities for processing, generally in shallower waters, and then on to export markets. In many cases, the host infrastructure already exists, although facilities modifications may be required. Certain of these developments require commingling flow from multiple wells, possibly from multiple fields and an assortment of owners. In order to allocate production in these cases, measurement of the full wellstream fluids may be required.

Add to this the greater uncertainty of, and lack of recognized standards for, multi-phase measurement, then place the meters subsea in deep water, and one quickly enters uncharted waters.

Key to the use of multi-phase and wet-gas meters (subsea or topside) is the ability of an allocation system to account for the differential uncertainty of all the metering devices in the system. Even with established standards and practices, the process of reaching agreement on single-phase measurement allocation methodology involving multiple leases and owners is difficult. It is important to understand that subsea wet-gas meters, or any metering system in such a remote and isolated environment, are very likely to experience a higher level of uncertainty, and will probably be exposed to longer periods of undetected, uncorrected bias errors than conventional topside metering systems. When these systems are placed in a commingled operation where they provide input for an allocation of production, the financial risk to the parties involved will be greater than is normally experienced with single-phase, accessible measurement systems. This RP presupposes that these risks are recognized, and that they have been accepted by the affected parties.

This RP presents a recommended allocation methodology that is technically defensible and mathematically optimized to best fit the application, and that equitably accommodates variances in the uncertainty level between meters in the system.

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Suggested revisions are invited and should be submitted to the standardization manager, American Petroleum Institute, 1220 L Street, N.W., Washington, D.C. 20005. As it is intended for this RP to be updated within approximately one year, comments on this edition will be very much welcomed.