



Bridging Document
between the
Petroleum Resources Management System
and the
United Nations Framework Classification for
Resources (UNFC)

Effective 2013

As contained in Annex IV of Part II of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 incorporating Specifications for its Application (ECE Energy Series No. 42)



ANNEX IV ^a

BRIDGING DOCUMENT BETWEEN PRMS AND UNFC-2009

I. INTRODUCTION

Bridging Documents explain the relationship between UNFC-2009 and another classification system that has been endorsed by the Expert Group on Resource Classification as an Aligned System. They incorporate instructions and guidelines on how to classify estimates generated by application of that Aligned System using the UNFC-2009 Numerical Codes. The relevant Bridging Document shall be identified when reporting estimates using the UNFC-2009 Numerical Codes.

A long-standing agreement is in place for the Society of Petroleum Engineers (SPE) to provide the commodity-specific specifications for petroleum. In accordance with this agreement, SPE has provided commodity-specific specifications via the Petroleum Resources Management System of 2007 (hereinafter referred to as "PRMS").¹ Along with the Generic Specifications, these provide the foundation and keystones for consistent application of UNFC-2009 for petroleum.

PRMS is independent from UNFC-2009 and may be mandatory for reporting purposes in some jurisdictions or in particular circumstances. This Bridging Document has no bearing whatsoever on such mandatory reporting requirements or on the independent application of PRMS.

Unless constrained by regulation, the application of commodity-specific specifications shall not limit in any way the use of the full granularity of UNFC-2009.

II. OVERVIEW OF PRMS

The definitions and guidelines of PRMS are designed to provide a common reference for the international petroleum industry, including national reporting and regulatory disclosure agencies, and to support petroleum project and portfolio management requirements. They are intended to improve clarity in global communications regarding petroleum resources. It is expected that PRMS will be supplemented with industry education programmes and application guides addressing their implementation in a wide spectrum of technical and/or commercial settings. It is understood that the definitions and guidelines of PRMS allow flexibility for users and agencies to tailor application for their particular needs; however, any modifications to the guidance contained in PRMS should be clearly identified. The definitions and guidelines contained in PRMS must not be construed as modifying the interpretation or application of any existing regulatory reporting requirements.

^a Annex IV from Part II of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 incorporating Specifications for its Application (ECE Energy Series No. 42). For consistency, the numbering of the footnotes is the same as in the original Bridging Document i.e. 18 to 21.

¹ See also second paragraph in Section II 'Overview of PRMS' for further details. Available at: www.spe.org/industry/docs/Petroleum_Resources_Management_System_2007.pdf.

Approved by the SPE Board in March 2007, the PRMS for defining reserves and resources was developed by an international group of reserves evaluation experts led by SPE and co-sponsored by the World Petroleum Council (WPC), the American Association of Petroleum Geologists (AAPG) and the Society of Petroleum Evaluation Engineers (SPEE), and was subsequently endorsed by the Society of Exploration Geophysicists (SEG).

In November 2011, the sponsors of PRMS published the “Guidelines for Application of the Petroleum Resources Management System” to improve its application and use.²

III. DIRECT MAPPING OF CATEGORIES AND SUB-CATEGORIES

A. Application of the G-axis

The Geological Knowledge (G) axis has a direct mapping to the PRMS Range of Uncertainty as shown in Figure IV.1.

As described in the Generic Specifications, if a quantity is expressed for the G4 Category without Sub-category refinement, then the sum of the G4.1 and G4.2 Sub-categories shall be stated. This equates to the Best Estimate for Prospective Resources under PRMS.

Figure IV.1

Mapping of PRMS Range of Uncertainty Categories to UNFC-2009 G Axis.³ Note: the scenario method may also be referred to as the cumulative method.

PRMS Categories		UNFC-2009 Categories
Reserves (Incremental)	Proved	G1
	Probable	G2
	Possible	G3
Reserves (Scenario)	Proved (1P)	G1
	Proved plus Probable (2P)	G1+G2
	Proved plus Probable plus Possible (3P)	G1+G2+G3
Contingent Resources	Low Estimate (1C)	G1
	Best Estimate (2C)	G1+G2
	High Estimate (3C)	G1+G2+G3
Prospective Resources	Low Estimate	G4.1
	Best Estimate	G4.1+G4.2 (=G4)
	High Estimate	G4.1+G4.2+G4.3

² Available at: http://www.spe.org/industry/docs/PRMS_Guidelines_Nov2011.pdf.

³ Combinations of G axis Categories (or Sub-categories), such as G1+G2, are shown here for illustrative purposes only. In practice, they will always be associated with E and F axis Categories (or Sub-categories) and documented as Classes in the form: 111+112, for example.

B. Detailed mapping of the E and F axes

The direct and unique mapping of PRMS uncertainty categories to the G axis allows the mapping of PRMS Project Maturity Sub-classes to a matrix formed from the Economic and Social Viability (E) and Field Project Status and Feasibility (F) axes. Figure IV.2 shows the mapping where optional Sub-classes have not been used, while Figure IV.3 shows a mapping of the E-F Sub-category matrix to the PRMS Project Maturity Sub-classes with a colour coded and numeric key. Note that the E and F Categories set minimum standards for the UNFC-2009 Classes. For example, a Potentially Commercial Project must be at least E2 and F2, but it could also be E1F2 or E2F1.

Figure IV.2

Mapping of PRMS and UNFC-2009 Classes and Categories. See preceding paragraph for explanation of “minimum”. PRMS Contingent Resources are always subdivided in UNFC-2009 between Potentially Commercial Projects and Non-commercial Projects based on the distinction between E2 and E3 Categories. Non-sales quantities are always classified as E3 in UNFC-2009. See text for further details.

PRMS Class		UNFC-2009 “minimum” Categories			UNFC-2009 Class
Discovered	Reserves	E1	F1	G1,G2,G3	Commercial Projects
	Contingent Resources	E2	F2	G1,G2,G3	Potentially Commercial Projects
		E3	F2	G1,G2,G3	Non-Commercial Projects
	Unrecoverable	E3	F4	G1,G2,G3	Additional in Place ^a
Undiscovered	Prospective Resources	E3	F3	G4	Exploration Projects
	Unrecoverable	E3	F4	G4	Additional in Place ^a

^a Additional quantities in place associated with known deposits (discovered) and with potential deposits (undiscovered).

As shown in Figure IV.3, there are a large number of cells within the E-F matrix that are labelled as Less Common Mappings. These are cells which result from mappings where the E-F combination would not generally be expected to occur, but could still be possible, or where there is a logical inconsistency with the level of project and socio-economic maturity. Classifying the cells as less common in this document does not preclude their use in UNFC-2009, but the quantities would need to be mapped to PRMS on a case by case basis to ensure that they were fully consistent with

the definitions. In general, a project cannot be declared as meeting social and economic criteria until it has progressed to a sufficiently defined level of technical maturity.

Figure IV.3

Mapping of the E-F Matrix to the PRMS Project Maturity Sub-classes with a Colour Coded and Numeric Key. Relationship between PRMS and UNFC-2009 G axis Categories is shown in Figure IV.1. Note 12: in PRMS, where permitted by regulation, lease fuel (but not any other E3.1 non-sales quantities) can be included in Reserves, but should be reported separately from sales quantities. See Section IV.A of this Bridging Document for details.

	F1.1	F1.2	F1.3	F2.1	F2.2	F2.3	F3.1	F3.2	F3.3	F4
E1.1	1	2	3	4						
E1.2	1	2	3							
E2			4	4	5					
E3.1	12	12	12	12	12	12				
E3.2			6	6	6		8	9	10	
E3.3			7	7	7	7				11

Discovered	Reserves	On Production	1	
		Approved for Development	2	
		Justified for Development	3	
	Contingent Resources	Development Pending	4	
		Development Unclassified or On Hold	On Hold	5
			Unclassified	6
		Development Not Viable	7	
Unrecoverable		11		
Undiscovered	Prospective Resources	Prospect	8	
		Lead	9	
		Play	10	
	Unrecoverable		11	
Special Cases	Defined but not classified in PRMS		12	
	Less Common Mappings			

However, in certain circumstances, a project may be seen to be unequivocally commercially viable (E1.1), e.g. a very large oil discovery in a mature hydrocarbon province, even though appraisal activities are still on-going in order to optimize the development plan (F2.1). Such a project would be still be classified as a Potentially Commercial Project under UNFC-2009 and a Contingent Resource under PRMS.

Most PRMS Project Maturity Sub-classes map to more than one location in the E-F matrix, as shown in Figure IV.3. Section IV of this Bridging Document describes how the quantities within these PRMS Sub-classes shall be assigned to the correct Sub-classes within UNFC-2009. There are also some quantities described in UNFC-2009 that are not specifically included within PRMS resources description, although they are part of the total commodity initially in place. This issue is discussed in Section V of this Bridging Document.

There are four cells within the E-F matrix that map directly and uniquely to corresponding PRMS Project Maturity Classes. These cells relate to exploration projects (Prospective Resources in PRMS) and additional quantities in place (Unrecoverable in PRMS).

C. Exploration prospects

The Generic Specifications of UNFC-2009 define Sub-categories for the F axis that map directly to the PRMS Project Maturity Sub-classes for Prospective Resources. UNFC-2009 enforces the use of the E3.2 and G4 Sub-categories for classification of Exploration Projects. Figure IV.4 shows the full mapping of UNFC-2009 to PRMS for Exploration Projects and Prospective Resources.

Figure IV.4

Mapping of UNFC-2009 Exploration Projects to PRMS Prospective Resources

		Low Estimate	Best Estimate	High Estimate
Prospective Resources	Prospect	E3.2,F3.1,G4.1	E3.2,F3.1,G4.1+G4.2	E3.2,F3.1,G4.1+G4.2+G4.3
	Lead	E3.2,F3.2,G4.1	E3.2,F3.2,G4.1+G4.2	E3.2,F3.2,G4.1+G4.2+G4.3
	Play	E3.2,F3.3,G4.1	E3.2,F3.3,G4.1+G4.2	E3.2,F3.3,G4.1+G4.2+G4.3

D. Additional Quantities in Place

In the context of petroleum, additional quantities in place under UNFC-2009 correspond to those quantities that are currently classified as unrecoverable within discovered and undiscovered resources. Within the E-F matrix, additional quantities in place are found at the intersection of the E3.3 and F4 Categories. These are mapped to the Unrecoverable class in PRMS.

PRMS has two Unrecoverable classes, one representing unrecoverable quantities associated with discovered resources and a second representing the unrecoverable quantities associated with undiscovered resources. Within UNFC-2009, the geologic uncertainty for discovered quantities is described using Categories G1 to G3, while the geologic uncertainty for undiscovered quantities is described using Category G4, thus it is possible to have a unique mapping between the systems as shown in Figure IV.5.

Figure IV.5

Mapping of UNFC-2009 Additional Quantities in Place to PRMS Unrecoverable Quantities.

		Low Estimate	Best Estimate	High Estimate
Unrecoverable	Discovered	E3.3,F4,G1	E3.3,F4,G1+G2	E3.3,F4,G1+G2+G3
	Undiscovered	E3.3,F4,G4.1	E3.3,F4,G4.1+G4.2	E3.3,F4,G4.1+G4.2+G4.3

IV. SUB-DIVISION OF PRMS PROJECT MATURITY CLASSES TO MULTIPLE UNFC-2009 SUB-CATEGORIES

As UNFC-2009 contains more granularity than PRMS, it is to be expected that there will be many instances where a single PRMS project maturity Sub-class could reflect multiple combinations of UNFC-2009 Sub-categories. This is evident in Figure IV.3. In addition, one of the PRMS Sub-classes is subdivided into two UNFC-2009 Sub-classes. The criteria to be used to subdivide PRMS Sub-classes to utilize the full breadth of UNFC-2009 are described in the next two sections for Commercial Projects (equivalent to projects with Reserves), and Potentially Commercial and Non-Commercial Projects (equivalent to projects with Contingent Resources).

A. Commercial projects sub-categorization

PRMS project maturity Sub-classes for Reserves map directly to the UNFC-2009 Sub-categories F1.1 to F1.3 on the F axis, but can also be mapped to the E1.1, E1.2 or E3.1 Sub-categories on the E axis.

The subdivision of quantities between E1.1 and E1.2 for PRMS Reserves categories is completed by following the definitions of the Sub-categories. Quantities where extraction and sale is economic on the basis of current market conditions and realistic assumptions of future market conditions are categorized as E1.1. Quantities for which extraction and sale is not economic on the basis of current market conditions and realistic assumptions of future market conditions, but is made viable through government subsidies and/or other considerations are categorised as E1.2.

PRMS recommends that “lease fuel should be treated as shrinkage and is not included in sales quantities or resource estimates”. However, PRMS then states that if lease fuel is reported as Reserves (which is permitted under some regulations), it should be reported separately from sales quantities. PRMS also notes that all non-sales quantities (lease fuel, flare, and losses) may be separately identified and documented in addition to sales quantities.

UNFC-2009 does fully represent the total commodity initially in place, but does not recognize lease fuel as part of Commercial Projects: under UNFC-2009, lease fuel (plus flaring and other losses) is always reported separately from sales quantities. All such quantities (lease fuel, flare or other losses) are categorized within the E3.1 Sub-category as non-sales. The project Sub-category (F axis) will be the same as that associated with the quantities being extracted and sold from that project. The level of geologic uncertainty will similarly reflect the project uncertainty. When mapping a

volume from the UNFC-2009 E3.1 Sub-category to PRMS, care must be taken to exclude such quantities from Reserves or, if appropriate, to assign only the lease fuel to the Reserves Category and, in such cases, to document them separately from sales quantities. Flare gas and other losses are defined by PRMS but not explicitly categorized, but good practice would be to maintain a record of the quantities outside of the categorization.

B. Potentially commercial and non-commercial project sub-categorization

The mapping of Potentially Commercial and Non-Commercial Projects with PRMS Contingent Resources is slightly more complex with each project needing to be reviewed for the level of socio-economic and technical maturity.

There is a close link between PRMS project maturity Sub-classes and the UNFC-2009 Sub-classes, as shown in Figure IV.6. Note that the Sub-categories set minimum standards for the UNFC-2009 Sub-classes. For example, Development Pending must be at least E2 and F2.1, and cannot be equated to E3 or to F2.2 (or lower). On the other hand, it could also be E1F2.1 or it could be E2F1.3.

Figure IV.6

Mapping of PRMS Contingent Resource Sub-classes to UNFC-2009 Sub-classes using E and F Axis Categories and Sub-categories. See preceding paragraph, for explanation of “minimum”.

	PRMS Sub-class	E axis “minimum” Category or Sub-Category	F axis “minimum” Sub-Category	UNFC-2009 Sub-class
Contingent Resources	Development Pending	E2	F2.1	Development Pending
	Development Unclassified or on Hold	E2	F2.2	Development on Hold
		E3.2	F2.2	Development Unclassified
	Development not Viable	E3.3	F2.3	Development not Viable

Mapping of the three PRMS Sub-classes to the UNFC-2009 Categories and Sub-categories shall be based on the following guidelines.

Development Pending projects must, as a minimum, satisfy the definitions of both F2.1 and E2, but could fall in either the F1.3 or F2.1 Sub-category based on the level of technical feasibility. A project that meets all technical requirements but does not meet current economic thresholds is sub-categorized as F1.3. Further, a project with remaining technical feasibility issues to be

resolved is sub-categorized as F2.1 but, if there is no doubt about commercial viability, it could satisfy the definition of E1.1.

Sub-category E1.2 would not normally be expected to be associated with a project that is classified as Development Pending in PRMS. The reason for this is that there has to be no doubt about commercial viability (as mentioned in the preceding paragraph) and this is unlikely to be the case at that point in time (when the project is still under evaluation) if it requires a subsidy.⁴

PRMS has a single Sub-class of “Development Unclassified or on Hold”, which corresponds to two separate Sub-classes in UNFC-2009, as illustrated in Figure IV.5. Therefore, particular care is required to ensure that the appropriate distinction is made based on the UNFC-2009 Sub-category definitions so that projects are assigned to the correct UNFC-2009 Sub-class.

Projects On Hold are similar to Development Pending projects, but their progression towards commerciality is constrained by activities which may or may not be outside the control of the evaluator. Projects on Hold are classified as E2F2.2 to reflect the chance of commerciality but taking into account the current lack of activity progress.

Development Unclassified projects are those where there is currently an insufficient basis for concluding that there are reasonable prospects for eventual economic extraction. This is generally due to a lack of data to make the assessment, or where the evaluation is still at an early stage. The projects are sub-categorized as E3.2 and as F1.3, F2.1 or F2.2 based on the level of technical maturity. A project that meets all technical requirements but does not meet current commercial thresholds is sub-categorized as F1.3. A project with remaining technical and commercial issues to be resolved is sub-categorized as F2.1. If activities are on hold, or evaluation is still to be completed, the project is sub-categorized as F2.2.

Development not Viable projects are technically feasible projects (based on existing technology or technology currently under development), but they have been assessed as being of insufficient potential to warrant any further data acquisition activities or any direct efforts to remove commercial contingencies at this point in time. In such cases, it can be helpful to identify and record these quantities as part of a portfolio so that the potential for a commercial development opportunity will be recognized in the event of a major change in commercial conditions. The projects are not considered to have the potential for eventual commercial development as at the Effective Date, and are therefore always aligned with Sub-category E3.3 in UNFC-2009. Typically, the project will not have been matured technically due to the lack of potential and would be sub-categorized as F2.3. However, there could be circumstances where, for example, the project has been matured to F1.3 and then commercial circumstances have changed significantly.

⁴ Although such a combination of E and F Sub-categories is considered unlikely, it is not precluded, and each case needs to be reviewed in the light of the relevant circumstances.

V. IDENTIFICATION OF QUANTITIES DEFINED BUT NOT CLASSIFIED IN PRMS

As noted above, PRMS states that all non-sales quantities (lease fuel, flare and losses) may be separately identified and documented in addition to sales quantities. Where there is a need to differentiate between lease fuel, flare and losses within UNFC-2009, quantities of each non-sales type should be treated as a different product type (see Generic Specification D) and reported separately.

VI. DESCRIPTION OF RESERVES STATUS IN PRMS

Under PRMS, quantities classified as Reserves may be allocated to the following subdivisions based on the funding and operational status of wells and associated facilities within the reservoir development plan:

- Developed Reserves are expected quantities to be recovered from existing wells and facilities.
 - Developed Producing Reserves are expected to be recovered from completion intervals that are open and producing at the time of the estimate.
 - Developed Non-Producing Reserves include shut-in and behind-pipe Reserves.
- Undeveloped Reserves are quantities expected to be recovered through future investments.

As a generic system, UNFC-2009 does not provide additional sub-categories that correspond to these PRMS Reserves subdivisions. In addition, UNFC-2009 does not use the term Reserves.

Nevertheless, it is recognized that it may be useful at the generic level to reflect the funding and operational status of wells and associated facilities when reporting petroleum quantities using UNFC-2009. In such cases, the quantities associated with each relevant UNFC-2009 Class (or Sub-class, if used) may be reported in accordance with these subdivisions provided that in every case the aggregated quantities are also reported together with the appropriate UNFC-2009 Numerical Code for the Class or Sub-class.

Each of the Reserves status subdivisions may be abbreviated as indicated below, but the full name (excluding the word Reserves) shall always be provided (e.g. as a footnote) in association with the reported quantities. The accepted full names and their abbreviations are:

- DP: Developed Producing
- DNP: Developed Non-Producing
- U: Undeveloped

The names of these subdivisions and their abbreviations do not form part of the UNFC-2009 Numerical Code and should be incorporated either by placing them in parentheses after the Numerical Code or by including them in a separate column immediately adjacent to the Numerical Code.