Update on Status of Chinese Resources Classification Systems Mapping to UNFC

Yang Hua, Li Jian

Joint Task Force

April 27, 2016
OUTLINE

I. Background

II. Work Progress

III. Preliminary Mapping Scheme

IV. Next Steps
I. Background

1. The Mapping work is proposed during the 6th EGRC meeting


36. The Expert Group requested the Technical Advisory Group (TAG) to assist the relevant Chinese authorities to develop a mapping and bridging document between (i) the China Mineral Reserves and Resources Classification System and UNFC-2009, and (ii) the Chinese Petroleum Resources/Reserves Classification System and UNFC-2009.
I. Background

- Joint Taskforce Established

Joint Research Team

IV. EXPECTED ACHIEVEMENTS:
1. General Report, Comparison of China’s mineral Resources & Reserve Classification system and UNFC-2009
2. Special Commodity Reports ( compares China’s Oil & Gas Resources & Reserve Classification System and UNFC-2009, and China’s Solid mineral Resources & Reserve Classification System and UNFC-2009.

V. FINANCIAL BUDGET (EXPENSES)
The study will be self-funded by the parties involved, or negotiate as necessary.

VI. WORKING MODE
1. Procedure: to carry out project design and study jointly and systematically;
2. Communication: via e-mail, web conferences or calls, regular meetings of IGRC and other special technical discussion or exchange.

Signature: [Signature]
2. The mapping work is listed into the EGRC 2016-2017 work plan

Expert Group on Resource Classification Work Plan for 2016–2017:

Timeline:

(i) Outline of possible modifications to UNFC-2009: April 2016;
(ii) Series of case studies subject to resource availability: April 2016 to ongoing;
(iv) Update of the status of relevant mapping and bridging documents, including to the Chinese petroleum and mineral classification systems: April 2016, revised drafts April 2017.
II. Work Progress

1. Main Work Phases and Aspects

   A. In Depth Dissemination & Understanding
      - 2012 - now
      - Integrated Research
      - Extensively Investigation in China
      - Specialized Exchange and Discussion

   B. Learn International Experiences
      - 2015.6 - now
      - China-Ukraine Workshop
      - TAG-RIPED Work Session in Beijing
      - Petroleum Industry Reserves Seminar

   C. State Sponsored Research Project
      - 2015.9 - now
      - Classification Systems
      - Resources/reserves estimation specifications

   D. Preliminary Mapping Scheme
      - 2016.1 - now
      - Classification Systems
      - Resources/reserves estimation specifications

   E. Comment Solicitation
      - 2016.4 – coming future
      - Among specialist in solid mineral and petroleum industry
      - TAG-RIPED Work Session
      - Not finished yet ……
A. In Depth Dissemination & Understanding

Technical Exchange & Discussion

Investigation in Southwest China, in Chengdu City

EGRC Report Dissemination

Investigation in Northwest China, in Xian City

Technical Discussion with NOC experts

Investigation in Northeast China, in Herbing City
The China-Ukraine Workshop on Resources Classification: Status, Mapping and Application was held successfully in Beijing in June 3-6, 2015.

In the Workshop, major international classification systems (UNFC, PRMS, CRIRSCO) and their mapping, application and practice experience were discussed in depth.

The discussion on China Petroleum and Solid Mineral Resources Classification systems mapping to UNFC were led Yang Hua and Li Jian during the Workshop.
B. Learn International Experiences

➢ TAG-RIPED Work Session

With TAG’s supports, the TAG-RIPED work session has been held on Feb. 2-3, 2016 in RIPED.
B. Learn International Experiences

TAG shared in the mapping experience achieved;

RIPED introduced the Chinese petroleum classification system: history, features ......

Discussed major mapping issues, including related terminologies (P1, P2, P3), maturity, uncertainty, mapping approaches on E,F,G axis, and so on.

Supporting cases study was conducted and discussed as well.
Petroleum Industry Reserves Seminar

To promote international communication and better understand the international classification systems, a Industry Reserves Seminar of “Petroleum Reserves & Resources: Classification, Evaluation and Reporting” has been held successfully in Beijing on 8-9 March, 2016.

About 120 professional representatives from MLR, NOCs and other Energy Companies have attended the Seminar, and enjoyed the face-to-face discussion.
To support the mapping work on Chinese classification systems, the MLR sponsors a national research project, and identified qualified taskforces to conduct these studies by bidding.
April 25-26, **TAG and China Taskforce** have held work sessions on the **update of Chinese resources classification systems mapping** to UNFC 2009.  

Main highlights include:

- China taskforce **introduced** active Chinese classification systems and their related specifications, and reported the **work progresses, mapping approaches, and preliminary results** achieved;

- TAG members **shared** their studies and opinions, and **generally agree** the preliminary mapping schemes put forward by China taskforce;

- TAG **provided** helpful **guidance** and valuable **suggestions** on the further **improvement** of the mapping approaches;

- TAG and China taskforce discussed the **next-step work plan** as well.
1. Mapping Principals

Based on UNFC ideas and specifications, to further coordinate and interpret the Chinese active petroleum & mineral resources classification systems with UNFC definitions and codes;

Based on Chinese active petroleum and mineral classification systems (GB/T 19492-2004 & GB/T 17766-1999), characterize or extract E & F related connotations in Chinese classes and categories;

To establish the communication bridge between Chinese resources classification systems with UNFC.
2. Mapping Approaches/Methodologies

- By Definition Comparison;
- Mapping by Categories, Sub-Categories and Classes;
- Mapping by E & D Phases and Maturities;
- Supporting cases study and analysis
3. Preliminary Mapping Scheme - Petroleum

- CCPR Framework

Total Petroleum Initially In Place (PIIP)

Discovered PIIP (Geological Reserves)
- Measured PIIP (Measured Geological Reserves)
  - Proved EUR
  - Residual
  - Probable EUR
  - Probable Reserves
  - Probable Sub-economic Initial Reserves

- Indicated PIIP (Indicated Geological Reserves)
  - Residual
  - Possible Reserves
  - Probable Reserves
  - Probable Sub-economic initial reserves

- Inferred PIIP (Inferred Geological Reserves)
  - Residual
  - Resources in Prospects

Undiscovered Petroleum Initially In Place
- PIIP in Prospects
- Unmapped PIIP
- Residual
- Unmapped Resources

Production
- Proved Developed Remaining Reserves
- Proved Developed Initial Reserves
- Proved Initial Reserves
- Probable Sub-economic Initial Reserves
## 3. Preliminary Mapping Scheme - Petroleum

### Mapping with Definitions (by Category)

<table>
<thead>
<tr>
<th>Category</th>
<th>CCPR 2004 Definitions</th>
<th>UNFC Category</th>
<th>UNFC Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proved Developed Remaining Reserves</td>
<td>Reserves fully put into production, for which the production well pattern designed in the oil and/or gas field development plan has been completed and the associated facilities have been installed.</td>
<td>E1</td>
<td>F1</td>
</tr>
<tr>
<td>Proved Undeveloped Reserves</td>
<td>Reserves in the oil and/or gas reservoirs which have completed appraisal wells or already have a production pilot but the production well pattern has not been established yet.</td>
<td>E1</td>
<td>F1,F2</td>
</tr>
<tr>
<td>Proved Sub-economic Reserves</td>
<td>Those Proved Estimated Ultimate Recoveries anticipated to be economic, but for which uncertainties in contract and/or enhanced recovery technologies still exist. <em>(P8 5.3.1.3, B)</em> Those Proved Estimated Ultimate Recoveries for which the feasibility studies indicate the development is sub-economic <em>(P8 5.3.1.3, A)</em>.</td>
<td>E2</td>
<td>F2</td>
</tr>
<tr>
<td>Probable Reserves</td>
<td>Feasibility studies show the development is economic; There should be at least 50% probability that the quantities actual recovered in the future will equal or exceed the probable reserves.</td>
<td>E1</td>
<td>F2</td>
</tr>
<tr>
<td>Probable Sub-economic Reserves</td>
<td>Differences between the Probable technical estimated ultimate recoveries and the Probable economic initial recoverable reserves.</td>
<td>E2</td>
<td>G2</td>
</tr>
<tr>
<td>Possible EUR</td>
<td>It refers to the exploration well achieved oil or gas flow and shown value for further exploration. As no enough data available at this stage, Possible EUR is intrinsic Economic.</td>
<td>E2</td>
<td>G3</td>
</tr>
<tr>
<td>Prospective Resources</td>
<td>Those recoverable volumes to be derived from the petroleum initially-in-place in prospects.</td>
<td>E3</td>
<td>F3</td>
</tr>
<tr>
<td>Unmapped Resources</td>
<td>Which are referred to the petroleum volumes recovered from Unmapped petroleum initially-in-place.</td>
<td>E3</td>
<td>G4</td>
</tr>
</tbody>
</table>
3. Preliminary Mapping Scheme - Petroleum

- **CCPR 2004 with UNFC Codes**

  - Total Petroleum Initially In Place (PIIP)
    - Discovered PIIP (Geological Reserves)
      - Measured PIIP (Measured Geological Reserves)
        - Proved EUR
          - Proved Initial Reserves
            - Proved Sub-economic Initial Reserves
              - Production
                - Proved Developed Remaining Reserves
      - Indicated PIIP (Indicated Geological Reserves)
        - Probable EUR
          - Probable Reserves
            - Probable Sub-economic Initial Reserves
              - Proved Developed Initial Reserves
                - Proved Undeveloped Initial Reserves
      - Inferred PIIP (Inferred Geological Reserves)
        - Possible Reserves
          - Residual
            - PIIP in Prospects
              - Resources in Prospects
                - Residual
                  - Unmapped Resources
        - Residual
          - Unmapped PIIP
    - Undiscovered Petroleum Initially In Place
      - PIIP in Prospects
        - Resources in Prospects
          - Residual
            - Unmapped Resources
              - Residual

  - Sale & Non-sale
    - 111
3. Preliminary Mapping Scheme - Petroleum

Proved Developed Remaining Reserves

Proved Sub-economic Reserves

Production

Proved Undeveloped Reserves

Probable Reserves

Probable Sub-economic Reserves

Possible EUR

Prospective & Unmapped Resources

Unrecoverable Volumes
3. Preliminary Mapping Scheme - Petroleum
4. Preliminary Mapping Scheme - Solid Mineral

<table>
<thead>
<tr>
<th>UNFC2009 category</th>
<th>sub category</th>
<th>China Standard 1999</th>
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</thead>
<tbody>
<tr>
<td>E1</td>
<td>E1.1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>E1.2</td>
<td></td>
</tr>
<tr>
<td>E2</td>
<td></td>
<td>2M</td>
</tr>
<tr>
<td>E3</td>
<td>E3.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E3.2</td>
<td>2S</td>
</tr>
<tr>
<td></td>
<td>E3.3</td>
<td></td>
</tr>
<tr>
<td>F1</td>
<td>F1.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F1.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F1.3</td>
<td>1</td>
</tr>
<tr>
<td>F2</td>
<td>F2.1</td>
<td>stage of feasibility study</td>
</tr>
<tr>
<td></td>
<td>F2.2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>F2.3</td>
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<td>F3</td>
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<td>F4</td>
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<td>G1</td>
<td></td>
<td>1</td>
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<tr>
<td>G2</td>
<td></td>
<td>2</td>
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<tr>
<td>G3</td>
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<td>3</td>
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<tr>
<td>G4</td>
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<td>4</td>
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Note:

- Cross means no corresponding item.
- Dotted line means applicable.
### 4. Preliminary Mapping Scheme- Solid Mineral

<table>
<thead>
<tr>
<th>class</th>
<th>sub-class</th>
<th>UNFC2009</th>
<th>China Standard</th>
<th>remarks</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>E</td>
<td>F</td>
<td>G</td>
</tr>
<tr>
<td>known deposit</td>
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<td></td>
<td>on production</td>
<td>1</td>
<td>1.1</td>
<td>1,2,3</td>
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<td>approved for development</td>
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<td>1.2</td>
<td>1,2,3</td>
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<td>development on hold</td>
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<tr>
<td>non-commercial projects</td>
<td>development unclarified</td>
<td>3.2</td>
<td>2.2</td>
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<td></td>
<td>development not viable</td>
<td>3.3</td>
<td>2.3</td>
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<td>additional quantities in</td>
<td>3.3</td>
<td>4</td>
<td>1,2,3</td>
</tr>
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<td></td>
<td>place</td>
<td></td>
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<td>potential deposit</td>
<td>exploration projects</td>
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<td>additional quantities in</td>
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<tr>
<td></td>
<td>place</td>
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</table>
E. Comment Solicitation & Further Update

- China Taskforce issue a full draft bridging document by **late July 2016**;
- TAG sub-group, China Taskforce should be in a position to issue an updated document by **late August 2016**.
- This updated document will then be forwarded to the full TAG and China Government (MLR) in **September 2016** (during **China Mining 2016**, tbc)
- Allowing for final edits, TAG should be in a position to issue a recommendation to the EGRC Bureau by **October 2016**.
- Assuming full approvals, the bridging document will be available for the **April 2017** annual EGRC meeting in Geneva.
- The bridging document will then be posted on the UNECE/EGRC website for a **60 day public comment period**.

F. Final Approval

- The documents with any required amendments based on public comments are then subject to review by the TAG-China Joint Taskforce and then forwarding to the Bureau for **final approval**.
Comments are welcome and should be forwarded to:
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Tel & Fax: +(86-10)-83598640

Thanks for your attention

Thank you!