ASME

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American Petroleum Institute

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Update on API and ISO Gas-Lift Standards and Recommended Practices

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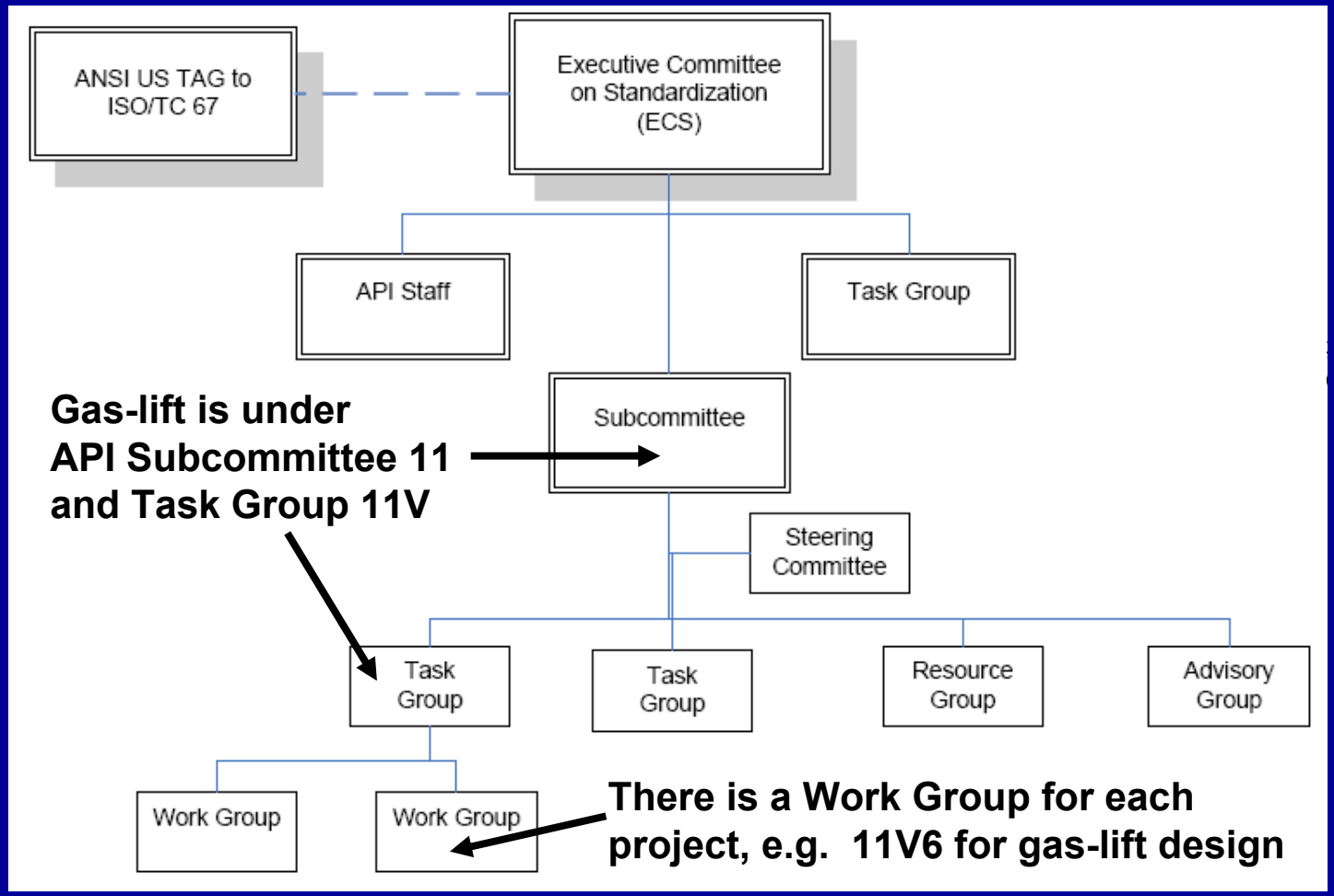
Introduction

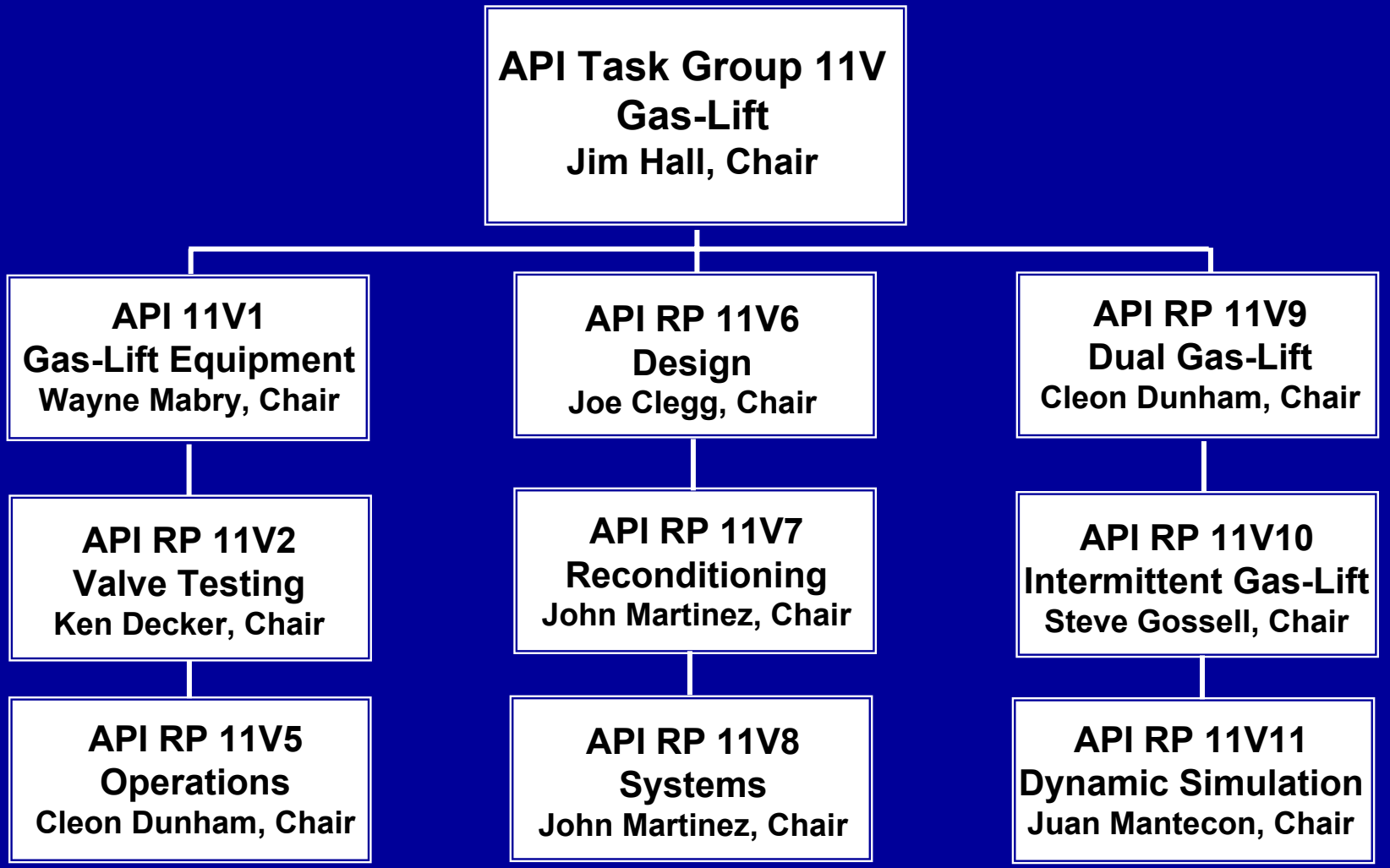
American Petroleum Institute (API) and International Standards Organization (ISO) teams develop standards and recommended practices for the gas-lift industry

- Overview of the processes
- Summary of existing documents
- Status of documents under development
- Potential plans for new documents

API Organization



API 11V Gas-Lift Organization



API Task Group Members

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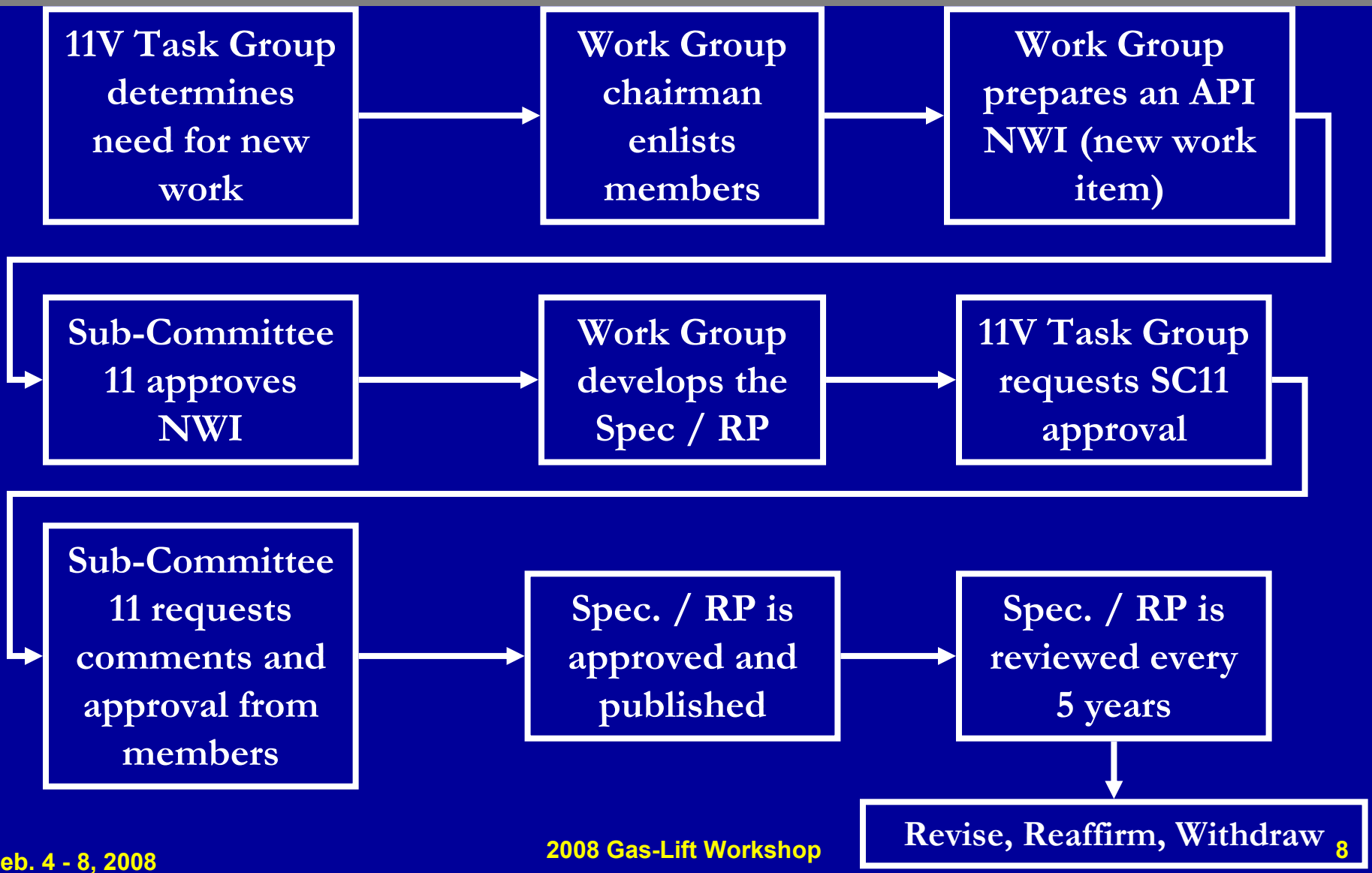
- Ali Hernandez, PDVSA (Inactive)

- Sid Thomas, Weatherford CPS, API Committee 11 Chairman
- Andy Radford, American Petroleum Institute

API Process


11V Task Group determines need for new work
Work Group chairman enlists members
Work Group prepares an API NWI (new work item)
Sub-Committee 11 approves NWI
Work Group develops the Spec / RP
11V Task Group requests SC11 approval
Sub-Committee 11 requests comments and approval from members
Spec. / RP is approved and published
Spec. / RP is reviewed every 5 years
Revise, Reaffirm, Withdraw

Nominal Timeline for an API RP

Process	Approx. Time (Months)
New idea by Task Group 11V	2 – 4
Approved by API Committees 11	2 – 4
New Work Group appointed (volunteers)	2 – 4
Developed by Work Group 11Vx	24 - 48
Approved by Task Group 11V	3 – 6
Voted by Committee 11	3 – 6
Reworked to address comments	3 – 6
Re-voted by Committee 11	3 – 6
Approved by API	3 – 6
Published by API	3 – 6
Total	48 – 96

Status of API Gas-Lift Documents

- **API Specification 11V1**
  - **Specification for Gas-Lift Equipment**
    - **Companies may receive an API Monogram for their equipment, certifying that they follow the standards specified in 11V1**
  - **Information from API 11V1 has been incorporated into:**
    - **ISO International Standard 17078.1 (Side-Pocket Mandrels); has been published**
    - **ISO 17078.2 (Flow Control Devices, i.e. Gas-Lift Valves); scheduled to be published by end 2007**
  - **API 11V1 will be reaffirmed in 2008 for people who continue to use it**
    - **It may be withdrawn, allowed to become inactive, or revised to be consistent with the ISO documents once they are published and in full use**

Status of API Gas-Lift Documents

- **API Recommended Practice 11V2**
  - **Recommended Practice for Gas-Lift Valve Testing and Modeling**
    - **Many gas-lift valve tests have been conducted and models have been built and tested using 11V2 as a guide**
  - **Information from API 11V2 has been incorporated into:**
    - **ISO 17078-2, scheduled to be published by end 2007**
    - **ISO 17078-4 (Recommended Practices), tentatively scheduled for publication in 2008**
  - **API RP 11V2 will be reaffirmed in 2008 for people who continue to use it**
    - **It will likely be withdrawn or allowed to become inactive once both ISO documents are published and in full use**

Status of API Gas-Lift Documents

- **API Specification 11V3 and Recommended Practice 11V4**
  - **These documents have been dropped; they do not exist**
    - **API Spec 11V3 was originally intended to provide specifications for Gas-Lift Mandrels; this information was incorporated into API Spec 11V1**
    - **API RP 11V4 was originally intended to provide recommended practices for Gas-Lift Installation; this information has been largely incorporated into API RP 11V5**

Status of API Gas-Lift Documents

- **API Recommended Practice 11V5**
  - **Recommended Practice for Operations, Maintenance, Surveillance, and Troubleshooting of Gas Lift Installations**
    - **This contains many recommended practices and guidelines for identifying and preventing or solving gas-lift problems**
    - **Good source material for gas-lift training**
    - **Originally issued, January, 1989; 2nd Edition, June, 1999**
  - **A new, significantly-enhanced version has been developed**
    - **This will be a revision to the original document**
    - **New version was approved by the API 11V Task Group in November, 2007**
    - **It will be submitted to API Subcommittee 11 to be reviewed for publication**

Status of API Gas-Lift Documents

- **API Recommended Practice 11V6**
  - **Recommended Practice for Design of Continuous Flow Gas-Lift Installations Using Injection Pressure Operated Valves**
    - **This contains three example gas-lift design methods**
    - **Good source material for gas-lift training**
  - **API RP 11V6 will be reaffirmed or revised in 2008**
    - **Some wording may be changed in 2008 to acknowledge use of gas-lift valve performance data in design**
    - **A 4th design method to use valve performance data may be added in the future; this may be considered when the document comes up for review in 2013**

Status of API Gas-Lift Documents

- **API Recommended Practice 11V7**
  - **Recommended Practice for Repair, Testing, and Setting Gas-Lift Valves**
    - **This contains useful recommendations and guidelines for repairing, testing, and setting gas-lift valves**
  - **Information from 11V7 has been incorporated into:**
    - **ISO International Standard 17078.4 (Practices)**
  - **API 11V7 will be reaffirmed in January, 2008 for people who continue to use it**
    - **Cannot revise without impacting API Spec 11V1 and API RP 11V2**
    - **It may be reaffirmed without changes, withdrawn, or allowed to become inactive once the ISO document is published and in full use**

Status of API Gas-Lift Documents

- **API Recommended Practice 11V8**
  - **Recommended Practice for Gas-Lift System Design and Performance Prediction**
    - **This contains useful recommendations and guidelines for designing gas-lift systems (combinations of wells and their gas delivery system) and for predicting the performance of gas-lift wells and systems**
    - **Originally published Dec. 2003**
    - **Will be reaffirmed or revised in 2008; the Work Group will consider some revisions to the text**

Status of API Gas-Lift Documents

- **API Recommended Practice 11V9**
  - **Recommended Practice for Design, Operating, and Troubleshooting of Dual Gas-Lift Wells**
    - **This contains useful recommendations and guidelines for designing, installing, operating, and troubleshooting dual gas-lift wells**
    - **It is a new Recommended Practice; it is 99% complete**
    - **Once it is completed by the Work Group it will be submitted to the Task Group for review**

Status of API Gas-Lift Documents

- **API Recommended Practice 11V10**
  - **Recommended Practice for Design and Operation of Intermittent and Chamber Gas-Lift Wells and Systems**
    - **This contains useful recommendations and guidelines for designing, installing, operating, and troubleshooting intermittent and chamber gas-lift wells and systems**
    - **This is a new Recommended Practice**
    - **The document was approved by the API 11V Task Group in November, 2007**
    - **It will be submitted to API Subcommittee 11 to be reviewed for publication**

Status of API Gas-Lift Documents

- **API Recommended Practice 11V11**
  - **Recommended Practice for Dynamic Simulation of Gas-Lift Wells and Systems**
    - **This is a new project; first meeting was on Nov. 15, 2007**
    - **It will contain useful recommendations and guidelines for using dynamic simulation techniques to design, troubleshoot, and optimize gas-lift wells and systems**
    - **It will focus on situations where steady-state methods are not sufficient due to unstable operations, such as during unloading, in long horizontal wellbores and flowlines, in risers, etc.**

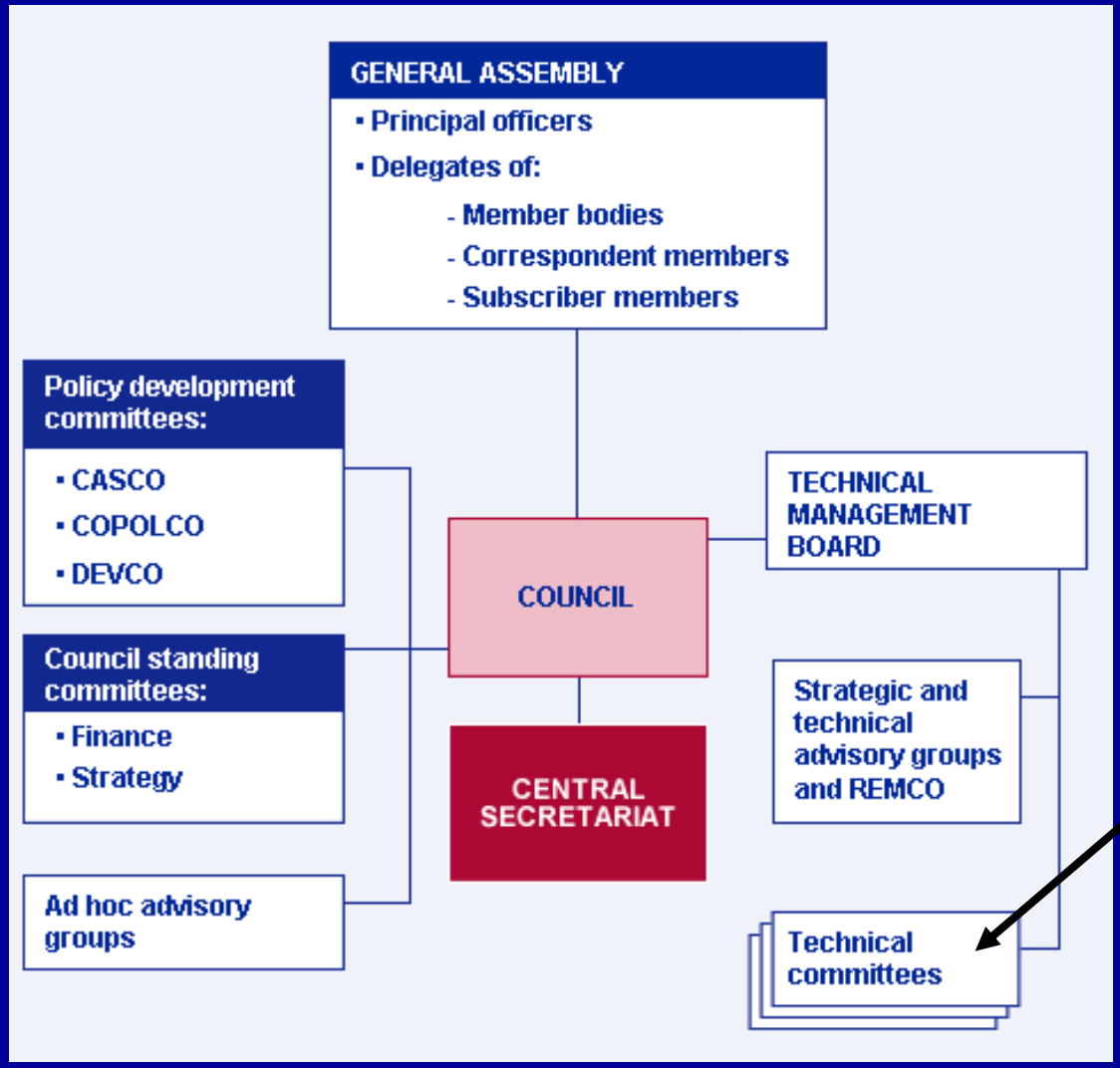
Potential Future API Gas-Lift Projects

- **Possible future API Gas-Lift Projects**
  - **Gas-Lift Automation**
    - Use of production automation for gas-lift operation, surveillance, troubleshooting, and optimization
    - This is partially covered in API RP 11V5
  - **Gas-Lift Design using Production Pressure Operated (PPO) Gas-Lift Valves**
    - PPO valves are mostly used in dual gas-lift wells
    - This is partially covered in API RP 11V9
  - **Surface Controlled Gas-Lift Valves**
    - This is a new, emerging technology; it may be too new to become an RP at this time
  - **Other Projects**
    - Other projects may be proposed by any member of the API 11V Task Group

Potential Future API Gas-Lift Projects

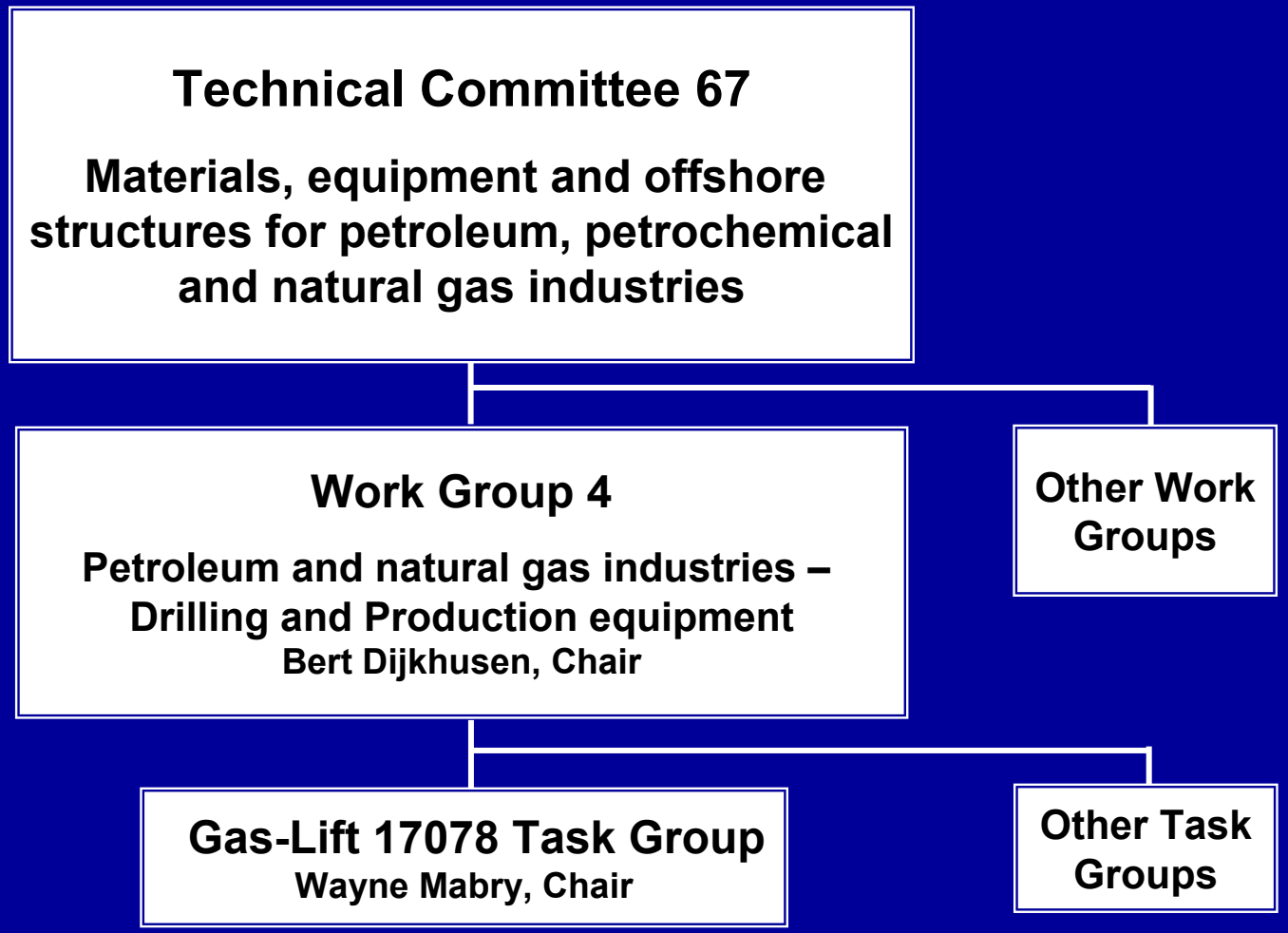
- **Possible future API Gas-Lift Projects**
  - **For these to happen:**
    - **A champion (Work Group leader) must step forward**
    - **A Work Group must be formed and staffed**
    - **The Task Group must approve the forming documents**
    - **API Subcommittee 11 must approve the project**

ISO Organization



Gas-Lift comes under Technical Committee 67

ISO Gas-Lift Organization



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- Zlatko Salihbegovic, Weatherford

- Greg Stephenson, eProduction Solutions
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- E. J. J. van Zandvoord , Shell International
- John Yonker, Halliburton

ISO Process

ISO Task Group Recommends New Project

ISO Work Group Approves New Project

ISO Task Group Drafts New International Standard

ISO Work Group Reviews Draft, Establishes Committee Draft (CD)

ISO Task Group Revises CD Version

ISO Work Group Submits CD for International Review

ISO Task Group Revises CD Version

ISO Work Group Establishes Draft International Standard (DIS), Submits for International Review

ISO Task Group Revises DIS Version

ISO Work Group Establishes Final Draft International Standard (FDIS), Submits for International Review

ISO Task Group Revises FDIS Version

ISO Publishes New International Standard

Status of ISO Gas-Lift Documents

- ISO International Standard 17078.1
  - Petroleum and natural gas industries -- Drilling and production equipment -- Part 1: Side-pocket mandrels
  - This document contains specifications for:
    - Design verification and validation testing of side-pocket mandrels
    - Product functional testing of side-pocket mandrels
  - Document status:
    - This document is published and in use
    - Some companies are building mandrels to this standard
    - Operating companies may order mandrels to this standard

Status of ISO Gas-Lift Documents

- ISO International Standard 17078.2
  - Petroleum and natural gas industries -- Drilling and production equipment -- Part 2: Flow-control devices for side-pocket mandrels
  - This document contains specifications for:
    - Design verification and validation testing of gas-lift valves
    - Product functional testing of gas-lift valves
  - Document status:
    - This document is in Final Draft International Standard (FDIS) status
    - ISO hopes to publish it before end 2007
    - At that time, operating companies may order gas-lift valves to this standard

Status of ISO Gas-Lift Documents

- **ISO International Standard 17078.3**
  - **Petroleum and natural gas industries -- Drilling and production equipment -- Part 3: Running, pulling and kick-over tools, and latches for side-pocket mandrels**
  - **This document contains specifications for:**
    - **Design verification and validation testing of running, pulling, and kick-over tools, and latches**
    - **Product functional testing of this equipment**
  - **Document status:**
    - **This document is in Draft International Standard (DIS) status**
    - **ISO hopes to publish it before end 2008**
    - **At that time, operating and service companies may order running, pulling, and kick-over tools and latches to this standard**

Status of ISO Gas-Lift Documents

- ISO International Standard 17078.4
  - Petroleum and natural gas industries -- Drilling and production equipment -- Part 4: Practices for side-pocket mandrels and related equipment
  - This document contains recommended practices and guidelines for such things as:
    - Setting up gas-lift testing shops
    - Training gas-lift shop personnel
    - Training operating company gas-lift personnel
  - Document status:
    - This document is in Committee Draft (CD) status
    - ISO hopes to publish it before end 2008
    - At that time, operating and service companies may use it to guide their gas-lift operations

Potential Future ISO Gas-Lift Projects

- **At this time, no future ISO gas-lift projects are planned**
  - **However, any member of the 17078 Task Group may nominate a project for consideration**
  - **It must be accepted by the Task Group, proposed to the Work Group, and approved by them before work on it can begin**

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