

Distribution Date:  
May 24, 2004

Minutes  
American Petroleum Institute  
COMMITTEE ON REFINERY EQUIPMENT  
RISK-BASED INSPECTION USER GROUP  
January 19-20, 2004  
Marriott Greenspoint, Houston, TX

**ATTENDEES:**

J. T. Reynolds, CHAIRMAN – Shell	D. Hampton – ConocoPhillips
M. S. Bell – Shell	P. A. Henry – Equity Engineering
B. Benson – Motiva	J. Horine – Amerada Hess
T. Brewster – Marathon Ashland	L. C. Kaley – Equity Engineering
J. Britton – DNV	P. McAndrew – Sunoco
B. D. Busch – BP	D. Lindballe – Petro-Canada
J. Bumgarner – Placid Refining	H. E. Mead – Shell
N. Carr – Equity Engineering	J. R. Riley – ChevronTexaco
M. J. Conley – Equity Engineering	C. Roberts – Atofina
K. Doggett – ConocoPhillips	E. Sanchez – Berwanger
S. J. DeVillier – Equity Engineering	K. Schoenleber – Shell
R. L. Downie – Lyondell-CITGO	L. Sequeiros – Marathon Ashland
P. Eckhardt – Coastal Araba Refining	J. Slovacek – Suncor Energy
C. B. Eckstein – PETROBRAS	R. Sitton – Berwanger
K. Eubanks – Marathon Ashland	K. J. Smith – ConocoPhillips
S. Flory – Marathon Ashland	S. Smith – Petro-Canada
E. Franz – Ashland Chemical	K. L. Van Loon – ConocoPhillips
M. Geisenhoff – Flint Hills Resource Group	H. D. S. Werneck - PETROBRAS
R. A. Goodman – API	C. White – Equity Engineering
K. Gottselig – Lyondell/Equistar	T. Wylie – Shell

**1. OPENING AND INTRODUCTIONS**

John Reynolds called the meeting to order at 1:00 p.m. The meeting attendance sheet is attached as Appendix I.

**2. APPROVAL OF AGENDA**

The meeting agenda (Appendix II) was approved as distributed.

### 3. APPROVAL OF MINUTES FROM PREVIOUS MEETING

The committee approved the minutes from the June 23-24, 2003, meeting as distributed.

### 4. SOFTWARE ISSUES

- A. Version 5.0 Release – CD's containing version 5.00.018 software and related data mining tools and other files were distributed to the members in attendance. All files distributed at the meeting and the latest updates are available on the E<sup>2</sup>G download website ([www.equityeng.com/distribution](http://www.equityeng.com/distribution)). To register for access to the website go to [www.equityeng.com/logon](http://www.equityeng.com/logon) to signup.

Lynne presented a tutorial of Version 5.0 that is provided in Appendix III. The tutorial began at the point where the user has installed and is beginning the transfer of files from previous editions of the software to 5.0. An overview of future enhancements to the software and added capabilities is included.

- B. Version 5.0 Training – A list of proposed training dates for 2004 were also provided in Appendix III. The training will consist of a one day workshop and a two-day session. After a group discussion, it was concluded that two sessions in Houston during the first half of the year would be required. Specific dates for each session were determined by input from the User Group training participants.

***ACTION: Lynne Kaley will revise the training schedule in Appendix IV to reflect the changes discussed in the meeting.***

- C. Technical Support for Previous Software Versions – The user group agreed with E<sup>2</sup>G's suggestion to end technical support for previous versions of the software at the end of 2004. This decision will be revisited if any members experience significant problems with installation or use of Version 5.0.

### 5. PROJECT TIMELINE REVIEW

Lynne Kaley presented a project schedule to reflect the status of progress on the milestones established for development of future additions to 5.0. The revised schedule is attached as Appendix IV. A timeline for software capabilities and release schedule is attached in Appendix V.

### 6. TECHNICAL WORKING GROUP

Hearl Mead of Shell has agreed to serve as chair of the TWG. A status of the TWG work program is provided in Appendix VI. The TWG has scheduled a meeting for March 8<sup>th</sup> to resolve several outstanding technical issues on modules under development or revision.

***ACTION: Hearl Mead will follow up with those persons with outstanding TWG action items.***

## **Corrosion Damage Modules**

- A. Soil/Underground Corrosion – The module write-up is complete and all ballot comments resolved. This module is ready for programming into the software based on direction from the working group.
- B. Cooling Water – This module has been revised based on a previous ballot. The revisions will require re-ballot by the group.
- C. Acid Sour Water – The module has been revised to resolve the negative from a previous ballot. Shell will review the document changes and a re-ballot will be done on that revision.
- D. CO<sub>2</sub> Corrosion – This model was revised based on the NORSOK model. A comparison of predicted corrosion rates based on the model is being compared to laboratory test rates by Users. Since most UG members do not have experience with this damage mechanism, the ballot will be sent to only to the following members: ConocoPhillips; ChevronTexaco, BP Saudi Aramco, and Shell.
- E. Thermal Fatigue Cracking – It was decided the current module is too broad and generic. It will be re-written with a new decision tree and will be merged with the mechanical fatigue. The working group will develop and review a document for ballot.
- F. Creep Damage – The module will be revised based on data presented at the October PVRC conference on the Omega model. The working group will develop and review a document for ballot.

## **Equipment Modules**

- G. AST Module – A major rewrite is required to address several editorial issues. The task group working on the module will determine if a re-ballot of the changes is required.
- H. Heat Exchanger Bundle Module – A major rewrite is required to develop a BRD chapter and document the technology. The working group will revise and review the document before re-ballot.
- I. Boiler Module – The document has been reviewed and revised by the working group. There were not enough responses to the last ballot. This document will have to be re-balloted.
- J. Fired Heaters – The module must be reworked to merge an API 530 with Omega to achieve valuable discrimination between furnaces. The working group will develop, review and revise before a ballot is required.
- K. Liners – This module needs an update to include thermal spray liners and address question raised by users. In addition, a liner inspection effectiveness table will need to be developed in order to include Liner considerations in the inspection planning module.

- L. HTHA – The HTHA module yields potentially non-conservative results for C-1/2 Mo materials in the current documented module. A proposal from MPC has been developed to improve the current module with learnings and information developed for API.
- M. Other module updates – There several other existing damage modules that require review and technical updates based on industry developments since the original development. The modules reviews include Amine SCC, Wet H<sub>2</sub>S Cracking, CUI, Naphthenic Acid/Sulfidation, Sour Water corrosion and Sulfuric Acid corrosion. The working group will schedule the work and develop these updates for ballot, as necessary.

The following table describes the schedule for those damage/equipment modules near or ready for balloting:

Priority	Module	Program. Funded?	Respon.	Complete Write-up	Issue Ballot	Return Ballot	Comment Resolution
1	Cooling Water	Y	TWG	Complete	Complete	Complete	9/1/03
2	Soil/Underground Corrosion	Y	TWG	Complete	Complete	Complete	9/1/03
3	Acid/Sour Water	Y	TWG	Complete	Complete	Complete	9/1/03
4	Storage Tanks	Y	E <sup>2</sup> G	6-30-03	7-3-03	9-1-03	10/1/03
5	HE Bundles	Y	E <sup>2</sup> G	10/1/03	10/1/03	12/01/03	1/1/04
6	Boilers	N	TWG	Complete	8/1/03	9/15/03	10/30/03
7	PRV	Y	E <sup>2</sup> G	8/1/03	10/15/03	12/31/03	2/15/04
8	CO <sub>2</sub>	N	TWG	7-15-03	8-1-03	9-5-03	10/1/03
9	Creep	N	E <sup>2</sup> G	12-1-03	12-8-03	2/1/04	3/1/04
10	Thermal Fatigue	N	E <sup>2</sup> G	12-1-03	12-8-03	2/1/04	3/1/04
11	Fired Heaters	Y	E <sup>2</sup> G	12/31/04	1/21/04	3/1/04	4/1/04
12	Liners	N	TWG	8/31/04	9/15/04	11/1/04	1/14/04
13	HTHA	N	TWG	12/31/04	1/21/04	3/1/04	4/1/04
14	CUI	N	TWG	6/8/04	7/1/04	9/1/04	10/16/04

Proposals for the projects noted in the above table as not currently funded are detailed in section 8. New Business.

## 7. CONSEQUENCE MODELER UPDATE

Phil Henry presented information on the update to the consequence model. The details of this effort are provided in Appendix VII.

## 8. PUBLICATION 581 (BRD) UPDATE

Due to the size of Publ. 581, balloting of the reformatted document will be done in sections.

***ACTION: Lynne Kaley will provide an outline and a list of changes made on the new edition of 581.***

## **9. SOFTWARE MARKETING**

Although not presented during the meeting, Appendix VIII provides an update on software marketing and sales.

## **10. NEW BUSINESS**

E<sup>2</sup>G submitted four new work proposals to the user group for approval. The proposals included a rewrite of RBI Base Resource Document (Publication 581); Damage Module Development and Programming; Heat Exchanger Module Documentation and Rewrite; and HTHA Development Module Rewrite and Programming. The proposals are provided in Appendices IX-XII.

## **11. NEXT MEETING**

The RBI Steering Committee will meet on July 8, 2004 at Shell Westhollow in Houston TX. The next meeting of the RBI User Group will be held on August 18-19, 2004, at the Marriott Greenspoint in Houston, TX.

## **12. ADJOURNMENT**

Having no additional business, the meeting was adjourned at 3:35 p.m.

Respectfully submitted,



Roland A. Goodman  
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