

Repr.	SIC	Ranking	Project	2001		2002		Ask	Delta	2003	2004
				Budget	Revised	Budget	Revised				
		2002									
			RP 579 Fitness for Service (FFS) <sup>Note 1</sup>	50	50	75	0		(75)	75	
			Materials Property Council (MPC - Deliverables)	30	30	40	20	10	(20)	40	40
			RP 941 (Hydrogen Attack - Nelson Curve Validation)	10	0	0	0		0	0	0
			Advanced Vanadium Steel for Reactors	0	0	0	0		0	20	20
			RP 571 (Damage Mechanisms) (matched in 2000-2001 by NB)	15	15	15	15		0	0	0
			Stability of Relief Devices (3%) RP 520 <sup>Note 2</sup>	0	60	75	42		(33)	75	75
			RP 943 Reactor Effluent Air Coolers (REAC) Corrosion	25	25	10	10		0	0	0
			ISO Support	10	10	10	5		(5)	10	
			Pressure Vessel Research Council (PVRC)	35	25	35	0		(35)	45	55
			Welding Research Council (WRC)	10	5	10	0		(10)	10	10
			510 (Pressure Vessel Inspection)			15	15		0	10	0
			Master Editor for RP-574 (Piping Inspection)		10	10	0		(10)	10	0
			Master Editor for RP-577		15	0	0	15	+	0	1
			Press Equip Integrity Trng (Opr & Crtsmn)	30	30	30	20*			5	0
			Regulatory Action Program	70	70	70	70*			70	0
			MPC Program Expense	10	10	10	10		0	10	10
			UT Performance Demonstration (Sizing)	20	0	20	40*			0	0
			Inspection Benchmarking Survey	10	10	20	10*			10	0
			Tank Seismic Issues (matched in 2001 by American Lifelines Alliance)	25	10	20	20		0	15	0
			ASME Representation & Standardization Activities	10	10	20	10		(10)		
			Automated Sizing				0	0	0	0	0
			Press Equip Inspector Trng	20	0	20	0		(20)	0	0
			Sulfidation in Hydrotreater Strippers/Fractionators			30	0		(30)	30	35
			AST Floating Roof Project	15	15	15	0		(15)	5	0
			Lightning Protection for Petroleum Storage Tanks			25	0		(25)	25	0
			580 Master Editor		10	0	0	0	0	0	0
			573 Master Editor		10	0	0	0	0	0	0
			Refractory Inspection RP and Certification				70*			0	0
		Totals		395	420	575	147	25	(288)	466	245

Note 1 Funds will be matched by Group to be set up (PVRC, FFS Institute) to cooperate with others (NB, ASME, etc)  
Note 2 Money on RP520 will be matched by Perf Consortium  
Note 3 2002 and 2003 are projections, and will be validated in future CRE meetings.

**Triennial CRE Report  
Pressure Vessels & Tanks  
September 26, 2001**

Bob Elliott, Chair

## 1. Goals & Objectives

### Vision Mission and Goals

- Industry efficiency – Life cycle Costs VS Risk
- Proactive to government intervention
- Safety
- Environment – continue developing proactive position

See attached draft “strawman”. At your convenience, CRE comment would be appreciated.

## 2. Activities

### 2.1. Inquiry & Agenda Item Efforts

Subgroup	1999		2000	
	Inquiries	Agenda Items	Inquiries	Agenda Items
Subgroup Design	25	9	31	4
Subgroup Fabrication	33	29	66	11
<b>Totals</b>	58	38	97	15

### 2.2. Task Groups

- Chair and many PVT members are participating in the SCI TG to rewrite RP 575 – Out for preliminary ballot.
- TG on Frangible Roofs – First agenda item to ballot.
- TG on External Pressure – First agenda item to ballot.
- TG on API 620 SS Appendix –
- TG on Metrication – Draft ballot discussed at this meeting
- TG on DOT Regulations – Summarizing compliance requirements (generating checklists) for breakout tanks. They will make recommendations as to whether there are any issues API should address.
- PIP Merge TG – Balloted

### 2.3. Outside Activities

- PIP

- PT-STAC (Pressure Technology – Sectoral Technical Advisory Committee, ASME). Provides liaison on pressure vessels issues, especially related to the European market.
- Regulatory Action Committee
- PVRC / WRC
- ASME

**2.4 Research Funding Support**

**2.4.1. Proposed Budget**

<b>Proposed Research Project Funding (\$ X 1,000)</b>				
<b>Project</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
PVRC	25	0	30	30
WRC	5	0	10	10
650 Seismic Update (Note 1)	10	20	15	0
Floating Roof Integrity	25	0	25	5
Vapor Loss Economics		0	30	0
Tank Grounding		0	10	0
Metrication		0	10	15
MFL Qualification Data		0	25	
Totals	65	\$20	\$155	\$60

Note 1: American Lifeline Alliance matches our funds

**2.4.2. Rationale**

- PVRC / WRC – Important and often only practical way to provide research on industry wide esoteric matters. Current specifics PV&T supports:
  - a. Local Thin Areas in PV Components, \$54K.
  - b. Modernization of Flange and Gasket Rules to Reduce Fugitive Emissions, \$22K.
  - c. Toughness Rules and Toughness Prediction, \$12K.
- 650 Seismic Update – Better to be player than have to conform to building standards. The American Lifeline Alliance matches our funds.
- Floating Roof Integrity – Integrity of floating roofs are at issue (fear safety, environment and money impacts)
- Vapor Loss Economics – Provide industry with cookbook tool to help decide when it is worthwhile (good environmental stewardship and saves money)
- Tank Grounding – The regulators may force potentially ridiculous requirements
- Metrication -- We have to join the world
- MFL Qualification Data – Need to help, especially the small company tank owners, and to provide credibility with regulators

### 3. Accomplishments

#### 3.1. Guidelines

On the PV&T Web Page. Provides guidance to new participant and some us with short memories. Recommends efficient processes.

#### 3.2. Web Site

- Inquiries Listing
- Agenda Items Listing
- Rosters
- Ballots
- Documents
- Inspector Certification
- Meetings & Minutes
- Symposiums
- Process Guidelines

#### 3.3. Electronic Processing

Capitalize on technology to increase quality, output and speed up the processes.

#### 3.4. Electronic Balloting

Time saver. Reduce compilation mistakes. Saves paper and postage. Faster.

#### 3.5. Major (Agenda Item) Standards Revisions

- 2.5.1. Floating Roofs (Appendices H) – major update.
- 2.5.2. Frangible roof – limit to 55’ diameter and larger. Working ways for smaller tanks.
- 2.5.3. Critical zone work – Reduced size of zone and allow work in zone.
- 2.5.4. 653 Appendix B – major step toward removing over conservatism which cost industry money and headache
- 2.5.5. Robots & RBI – Revised 653 to allow. We must conservatively keep up with technology

### 4. Membership

Subgroup	User	Manuf. & Contractor
Subgroup Design	15	14
Subgroup Fabrication	12	13
Totals	27	27

Numbers are OK.

Balance between User and Manufacturer / Contractors is acceptable.

Owner Users are diminishing. Not a problem now but may be if trend (outsourcing) continues.

## **5. Interface Activities**

### **5.1. API:**

- 5.1.1. MLF equipment & operator qualifications – With SCI
- 5.1.2. RP 579 – SCI
- 5.1.3. 2003, 2350, 2015 Tank Entry & Cleaning -- Safety & Fire Protection Committee
- 5.1.4. Inspector Certification -- SCI

### **5.2. Outside Liaison**

- 5.2.1. ASME
- 5.2.2. PT-STAC
- 5.2.3. ASTM E50.01 on their tank evaluation guide under development
- 5.2.4. PIP

### **5.3. How do we improve communication among SCs?**

I propose to be more involved in order to create more cooperative attitudes on both sides.

## **6. Issues**

- 6.1 Spend more not less money on technology, e.g., web site development – we want interactive site without needing Roland to push buttons for us.
- 6.2 Companies belt tightening – They are losing sight of long term API value. CRE have any ideas?
- 6.3 Regulatory pressures are increasing. Therefore, our proactive intervention should be increasing.
- 6.4 Not only is being a good environmental steward the right thing to do, it makes good business sense.
- 6.5 ASTM's Bottom Integrity Tank Evaluation guide will create confusion and potentially cause most of the companies we represent trouble. We will work with them and hopefully convince them society will be better off with one set of standards.
- 6.6 Agenda Item 653-097 (balloted) proposes a maximum of 10-year internal inspection interval when corrosion rates are not known and similar service is not available.

- 6.8 Inspector certification – balloting to require recurrent testing on Standard changes.
- 6.9 The majority seems to favor only allowing the use of RP 579 criteria when API 653 is silent.
- 6.10 For now, API 653 should stay in PVT and not move to SCI.

## 7. Future Plans

7.1. Mission and Goals used to keep us on track. Work up strategic plan.

### 7.1.1 "Top 3" Initiatives

- 1) Post agenda items and inquiries tracking documents on web page and use Web for SC work.
- 2) Reduce meeting cost – see attached slides from Joint Meeting presentation
- 3) Pursue support from chemical and paper industry
- 4) Reorganize 650

See attached vote results.

7.1.2. Technology. We must remain efficient by using the best available technologies. Do we need an advisory group? Should it be a Refining-wide group or should PVT do this on our own?

- Information handling, use of email, web sites and interactive technologies.
- Inspection, e.g., MFL qualifications and robotics.
- Fabrication, e.g., materials and fabrication efficiencies.

#### 7.1.2.1. Process Tools

Further develop Web Site:

SG Agenda Item and Inquiries Summaries with rationales

Work complex or lengthy issues

#### 7.1.2.2. Materials

We need to stay abreast of the latest materials technologies.

#### 7.1.2.3. Analysis

We need to stay abreast of the latest analysis technologies, e.g., fracture mechanics.

#### 7.1.3. PIP and Beyond.

- PIP Merge TG now working on API 650 Merge
- API 620
- API 653
- Bruce Roberts reports that the industry desires more standardized contractual requirements. I believe PVT should look at these typically “contract matters” and decide whether we want to further expand the merged standards.

7.1.4. Literature –We should be using the latest and best published reports and articles and encourage appropriate persons to generate such documents when needed.

End

**CRE SUBCOMMITTEE CHAIR ORAL REPORT**  
**Fall 2001, L.A.**

**SUBCOMMITTEE ON HEAT TRANSFER EQUIPMENT (SCHTE)**

**MAJOR ISSUES THE SUBCOMMITTEE IS ADDRESSING**

**1. Maintenance of 9 API Standards**

**2. Globalization of 5 of the 9 SCHTE Standards**

Adoption of and coordination with 5 ISO documents going smoothly

**3. Technical Inquiries**

**4. Liaison activities with other Subcommittees**

**Pressure Relieving Systems Subcommittee:**

**API 521** Guide for Pressure-Relieving and Depressuring Systems

[Overlap issues with 537 - Flares]

**Instruments and Control Systems Subcommittee**

**API 556** Instrumentation and Control Systems for Fired Heaters and Steam Generators

[No current publication activity] [Overlap issues with 535 - Burners]

**Inspection Subcommittee**

**API 573** Inspection of Fired Heaters and Boilers

[2001 publication target with input from SCHTE]

**Corrosion and Materials Subcommittee**

**API 579** Fitness for Service

[Reviewing draft of chapter on creep life.]

**Corrosion and Materials Subcommittee**

**API 936** Refractory Installation Quality Control Guidelines

[No current publication activity] [Overlap issues with 560 – Heaters]

**Mechanical Equipment**

**API 673** Special Purpose Centrifugal Fans

[2001 publication target][Overlap issues with 560 – Heaters resolved]

**5. Liaison activities with outside organizations**

**PIPS** (Process Industry Practices)

**NFPA** (National Fire Protection Association)

**ASME** (American Society of Mech. Engineers)

**CIBO** (Council of Industrial Boiler Owners)

**ANSI** (American National Standards Inst.)

**CMA** (Chemical Manufacturer's Association)

**TEMA** (Tubular Exchanger Manufacturers Assoc.)

**ISO** (International Standards Organization)

## CONCERNS OF THE SUBCOMMITTEE

### Participation Based on Roster Data

		Users	Manufacturers	Contractors	Total
Spring 2001	Participants	23	64	31	118
	Companies	12	22	27	61
Fall 2001	Participants	33	73	36	142
	Companies	11	28	22	61

### NEEDED OR SUCCESSFUL WORK PROCESS IMPROVEMENTS

1. Web site useful for Committee documents, agendas, meeting minutes
2. Round Table and Technical Discussions are very effective at drawing participation from the industry in the area of heat transfer and combustion
3. We have suspended round tables for this meeting in order to put a priority on standards work.

### CHANGES IN STANDARDS THAT COULD HAVE SIGNIFICANT BUSINESS IMPACT ON USERS

1. **535 Burners** – Revision from Technical Paper to RP will provide guidance on operating consequences of equipment choices not previously included, and address recent advances in low NOx technology.
2. **536 NOx Control** – Reaffirmation effort just starting will address recent changes in technology, especially low temperature SCR catalyst, that can significantly reduce retrofit costs.
3. **537 Flares** – will provide guidance on mechanical components not addressed in any other industry source, which should reduce reportable environmental incidents and increase time between necessary turnarounds.

	Project and Maintenance Costs (M\$ per Year per Typical Refinery)
<b>535 Burners</b>	100
<b>536 Post Combustion NOx Control</b>	500
<b>537 Flares</b>	100
<b>Total</b>	700
<b>15 % savings</b>	105

## PUBLICATION/REVISION SCHEDULE

### SCHTE Document Status

API	ISO	Description	Pub. Date	Status
530	13704	Heater Tube Thickness	1996 4 <sup>th</sup> ed. 2001 5 <sup>th</sup> ed. target	<ul style="list-style-type: none"> <li>• Fifth edition soon to be published.</li> <li>• Reference to 579 being discussed.</li> <li>• 13704 FDIS Ballot issued -- balloting ends 10/30/01.</li> <li>• Plan to nationally adopt 13704 after its publication and review.</li> </ul>
534		Heat Recovery Steam Generators	1995 1 <sup>st</sup> ed.	<ul style="list-style-type: none"> <li>• Change to RP approved.</li> <li>• Scheduling of revisions awaiting completion of other SCHTE work.</li> </ul>
535		Burners	1995 1 <sup>st</sup> ed. 2002 2 <sup>nd</sup> ed. target	<ul style="list-style-type: none"> <li>• Document undergoing major revisions</li> </ul>
536		NOx Control	1998 1 <sup>st</sup> ed.	<ul style="list-style-type: none"> <li>• Reaffirmation approved</li> <li>• Revision to start in 2002.</li> </ul>
537		Flares	2001 1 <sup>st</sup> ed. target	<ul style="list-style-type: none"> <li>• Draft being edited</li> </ul>
560	13705	Fired Heaters	1995 2 <sup>nd</sup> ed. 2001 3 <sup>rd</sup> ed.	<ul style="list-style-type: none"> <li>• Third edition published 2001.</li> <li>• 13705 FDIS being balloted.</li> <li>• Plan to nationally adopt 13705 after its publication and review.</li> </ul>
660	16812	Shell and Tube Heat Exchangers	1993 5 <sup>th</sup> ed. 2001 6 <sup>th</sup> ed.	<ul style="list-style-type: none"> <li>• New edition of API just published.</li> <li>• 16812 includes revisions in new API 660.</li> <li>• DIS passed with 100% approval, waiting on publication.</li> <li>• Plan to nationally adopt 16812 after its publication and review.</li> <li>• NWI for electronic data sheet being drafted.</li> </ul>
661	13706	Air Cooled Heat Exchangers	1997 4 <sup>th</sup> ed.	<ul style="list-style-type: none"> <li>• 13706 has been nationally adopted (as is) as next edition of 661.</li> <li>• New Work Initiative approved for revision of 13706.</li> </ul>
662	15547	Plate Type Heat Exchangers	1995 1 <sup>st</sup> ed.	<ul style="list-style-type: none"> <li>• 15547 has been nationally adopted (as is) as next edition of 662.</li> <li>• New Work Initiative approved for revision of 15547.</li> </ul>

Submitted by:  
Ed Shepherd, Chairman, Subcommittee on Heat Transfer Equipment

9/26/01

# SOME STATUS REPORT

## Fall 2001

### Standards

- 26 standards, RP's and internal documents.
- Presently have 13 active task forces ( 617, 612, 674, 684, 687, 610, 682, 672, 618, 613, 619, 616, Pulsation Analysis)
- 5 standards due for publication in 2001 (617, 673, 687, 682, 612 )
- API 687 was published in September.
- Will request activation for 611, 614, 671, 675, 676, 686 and a reliability data base std.
- Plan on publishing 610 and 682 in advance of ISO Equivalent Std.

### Personnel

- We continue to experience decline in company participation due to mergers and retirement packages. In the past, few task forces were headed by contractor's representatives. Today contractor and consultant personnel are chairmen of almost 60% of our Task Forces.
- To combat this we have had API place adds in technical publications, actively perused and given short courses at industry symposiums (A&M Turbomachinery Symposium ) We keep a listing of individuals who have expressed interest in becoming involved with API standards writing.
- Have recommended API (and they have implemented) publication booths at the two premier Mechanical equipment shows (A&M Pump and Turbomachinery Symposiums) .We will work with them in also using this outlet to get more participation.

### **Steering Committee**

- The steering committee meets via teleconference two times a month to address TF business and review TI's.
- Have 7 open TI's. We answered 27 TI's in 2000 and 10 in 2001.

### **ISO Issues**

- ISSC rules committee formed and having Phone meetings every ??
- Funding for conversion of API to ISO documents. Do not recommend API fund outside conversion of API to ISO documents.

### **Concerens**

- Continued decline with user participation.
- Delays to publication due to ISO procedures

### **Recommendations**

- API waive Spring and Fall registration fees for independent consultants who are Task Force Chairmen.
- Recognition for participation on API TF's.

**CRE SUBCOMMITTEE CHAIR'S**  
**"ORAL" REPORT**

**SUBCOMMITTEE ON CORROSION AND MATERIALS**  
**Fall, 2001**                      **Westin Bonaventure Hotel, Los Angeles, California**

**MAJOR ISSUES THE SUBCOMMITTEE IS ADDRESSING**

**Working to Increase Plant Reliability**

- Highest priority is RP ~~943~~<sup>932</sup> (Reactor Effluent Air Cooler systems); detailed review of draft document underway, expect to ballot Winter 2001
- Technical editor (MPC) working to complete draft of the Technical Basis for RP 941 (High Temperature Hydrogen Attack); also electronically organizing the data base (to be done over several years and maintained, as budget permits)
- TF on Failure Mechanisms is churning out damage mechanism modules for review; could always use more/better photos
- Investigating to what degree do some specific fabrication problems threaten reliability and reparability of new generation reactor steels

**Working to Reduce Capital Costs**

- First drafts underway for guidelines to safely take advantage of Duplex stainless steels, and higher strength 9Cr-1Mo-V alloy steel
- Tentatively planning to hold Roundtable in Spring 2002 on the effective use of Duplex stainless steels

**MAJOR CONCERNS OF THE SUBCOMMITTEE AND PROPOSED REMEDIES**

- No new major concerns

**CHANGES IN STANDARDS THAT COULD HAVE SIGNIFICANT BUSINESS IMPACT**

- RP ~~945~~<sup>937</sup> (REAC): see above
- RP 936 (Refractory QC): working to lower installation costs and reduce one of the largest causes of FCC unit unplanned downtime

**NEEDED OR SUCCESSFUL WORK PROCESS IMPROVEMENTS**

- Using Web pages more for ballot review, etc.
- MPC Deliverables: breaking down the deliverables into sub-components helping with accountability and budgeting

**PUBLICATION DEVELOPMENT OR REVISION SCHEDULE:**

<u>Standard</u>	<u>Status</u>	
RP 571 (Failures Mechanisms)	Drafting 1 <sup>st</sup> Ed.	-Expect ballot Fall 2002
RP 582 (Welding Guidelines)	New	-Published Spring 2001
RP 651 (CP of Storage Tanks)	2 <sup>nd</sup> Ed valid until 12/02	-Forming Task Force
RP 652 (Lining of Storage Tanks)	2 <sup>nd</sup> Ed valid until 12/02	-Forming Task Force
RP 920 (Brittle Fracture)	Withdrawn	-Superseded by 579 (FFS)
RP 934 (Alloy Heavy Wall Reactors)	New	-Published Spring 2001
RP 936 (Refractory Installation QC)	1 <sup>st</sup> Ed valid until 10/01	-Preparing to ballot Winter 2001
RP 941 (Hydrogen Attack)	5 <sup>th</sup> Ed valid until 1/02	-Preparing to ballot Winter 2001
RP <del>942</del> (REAC) <b>932</b>	Drafting 1 <sup>st</sup> Ed	-Expect ballot Spring 2002
RP 945 (Amine Cracking)	2 <sup>nd</sup> Ed valid until 10/02	-Preparing to ballot Winter 2001
Pub 938 (Causes of 1.25Cr Cracking)	1996	-No Action
Pub 939 (Wet H <sub>2</sub> S Service)	1994	-No Action
Pub 946 (Outgassing of Reactors)	1981	-No Action
Pub 959 (Temper Embrittlement)	1982	-No Action
Pub ?X (Guidelines for 9Cr-1Mo-V)	New	-Draft target Summer 2002
Pub ?X (Guidelines for Duplex SS)	New	-Draft target Summer 2002

**SUBMITTED BY: Ned Nicolls**  
**Chair, S/C on Corrosion**  
**And Materials**

**ENDORSED BY: Dave Koning**  
**Sponsor, Chevron**