SESSION	DESCRIPTION	TAB	MODULE
DAY 1			
1	COURSE INTRODUCTION • Workshop Objectives • Instructor Experience • Attendee's Experience • Agenda • Workshop Schedule	1	847-01
2	ROTATING EQUIPMENT OVERVIEW • Definition • Classifications of • Concept of "Train or Unit" • Important fundamentals	2	107
3-5	TYPES OF PUMPS	3	211
6	EFFECT OF THE PROCESS ON POSITIVE DISPLACEMENT AND DYNAMIC EQUIPNMENT AND COMPONENT CONDITION MONITORING	4	136
7	PUMP PERFORMANCE CURVES AND DATA • All Pump Curves in Session 3-5 • Concept of Reliability Envelope – EROE (EROE = Equipment Reliability Operating Envelope)	5	214

SESSION	DESCRIPTION	TAB	MODULE
8	BP 2.7 Operate in the EROE (Equipment Reliability Operating Envelope) BP 2.8 EROE monitoring & targets		
DAY 2			
9, 10	HYDRAULIC DISTURBANCES • Maintaining a Liquid • Types of: Cavitation, Recirculation and Total Vaporization complete with actual pictures of • Prevention of Hydraulic Disturbances • Field troubleshooting of	6	217

11	PUMP MECHANICAL DESIGN – VOLUTES, WEAR RINGS, IMPELLERS BEARINGS AND BALANCE DRUMS • Using Sabic Boiler Feed Pump	7	219
12-13	PUMP MECHANICAL SEALS • Using Pump Ethylene Seal (Plan 53C) and Boiler Feed Pump Seal (Plan 23) • Function of • The Seal System • Seal Configurations • Flush System Types • EROE checks & targets	8	220
14	PUMP CONTROL & PROTECTION	9	221

SESSION	DESCRIPTION	TAB	MODULE

15-16	COMPRESSOR TYPES & APPLICATIONS
	• General Overview of Types:
	  • Lobe
	  • Lubricated and Non- Lubricated Screw
	  • Vertical Laby Recip
	  • Horizontal Recip
	  • Centrifugal
	  • Horizontal Split
	  • Barrel
	  • Sideload
	  • Integral Gear
	  • Axial
		9	508

DAY 3

17-18	THE CONCEPT OF COMPRESSOR HEAD & PERF. CURVE EXAMPLES • Definition of • Head Required • Head Produced • Parameters involved • Reading & understanding curves (Curves in Session 25 & 26)	10	515
19-20	STALL, SURGE AND STONEWALL • Surge Facts	11	522

- Limits of the Curve
- Causes of Surge
- Causes of Stonewall (Choke)

21	DYNAMIC COMPRESSOR MECHANICAL DESIGN OVERVIEW • Gas Flow Path Components (Def of each component function From inlet to discharge flange) • Mechanical Components (Journal Bearing, Thrust Bearing, Balance Piston & Seals)	12	536

SESSION	DESCRIPTION	TAB	MODULE
DAY 3 CONTINUED			
22	COMPRESSOR RADIAL BEARING DESIGN • Hydrodynamic Bearing Function • Types of • Condition Monitoring • Vibration Principle Overview	13	126
23	COMPRESSOR THRUST BEARING DESIGN & THRUST BALANCE • Thrust Bearing Function • Condition Monitoring • Impeller and Balancing Forces • Thrust Force vs. Flow	14	132
24	BP 3.14 Use performance calculations and phase angle change to confirm fouling BP 3.20 Pad temperature and not only shaft displacement indicate excessive thrust		
DAY 4			
25-26	DGS SEAL & SYSTEM DESIGN • Dry Gas Seal Design • DGS Tandem Seal • DGS Tandem System • DGS Condition Monitoring	15	715 847-04
27	BP 9.3 Always monitor both primary and secondary tandem seal conditions		

BP 9.6 Use an external source of clean, dry seal gas, if available for maximum reliability

28 BP 9.7 Seal gas must be maintained at a higher pressure than reference gas or flare pressure

SESSION	DESCRIPTION	TAB	MODULE
29	LUBE SYSTEM DESIGN & OPERATION • Function Definition • Oil Condition Monitoring • Major Component(s) Function • Condition Monitoring • Oil Flushing Guidelines BP 7.26 Check system transient functions immediately before turnarounds	16	712 847-05
31	TYPES OF STEAM TURBINES ON SITE Using Sabic Examples of each type • Principles of Operation • Backpressure • Condensing • Extraction/Condensing • Single Stage	17	313 847-06
32	STEAM TURBINE PERFORMANCE CHARACTERISTICS • Characteristics • Steam Conditions • TSR (Theoretical Steam Rate) • ASR (Actual Steam Rate) • Turbine Efficiency • Using Performance Curves	18	302
31-32	STEAM TURBINE MECHANICAL DESIGN • Function of each steam path component – Inlet to Disch. Flg.	19	303