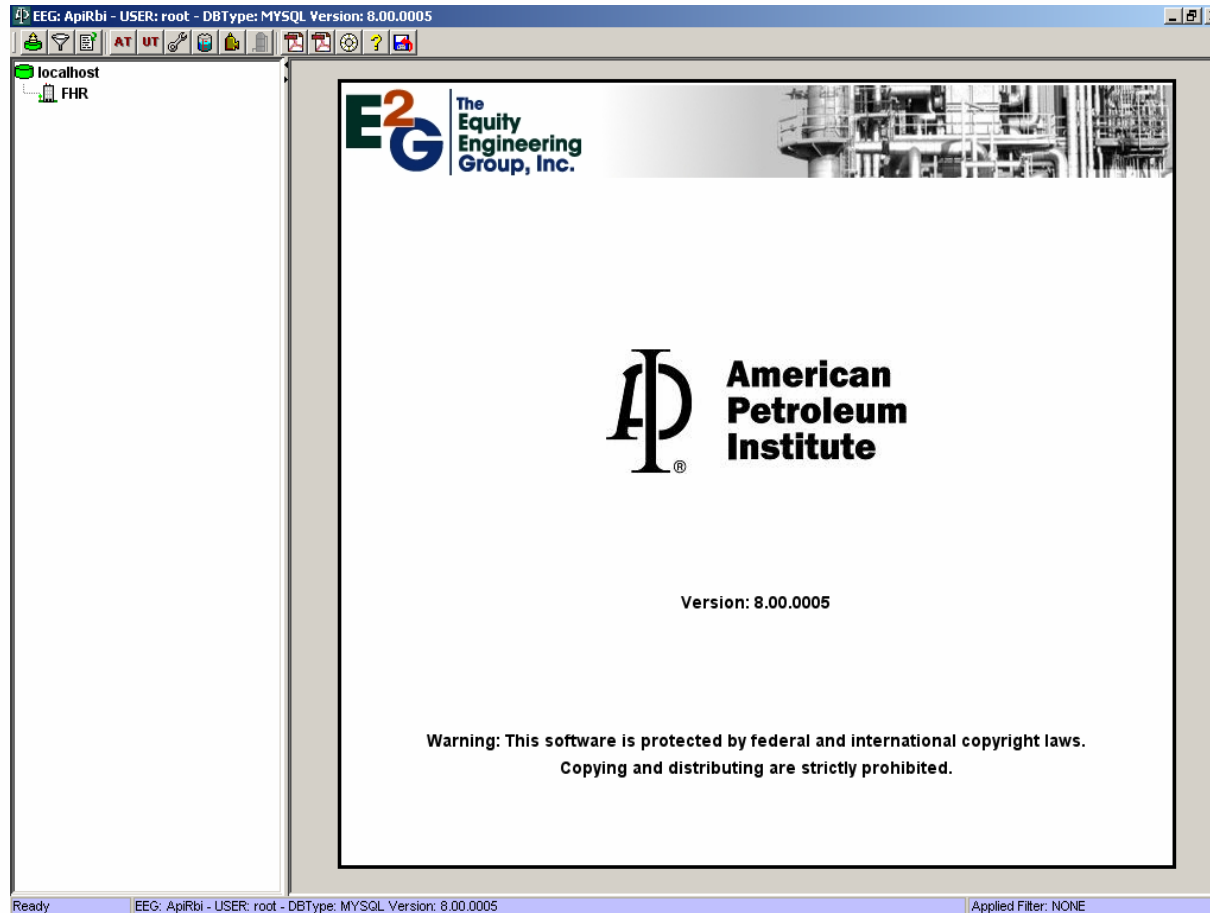


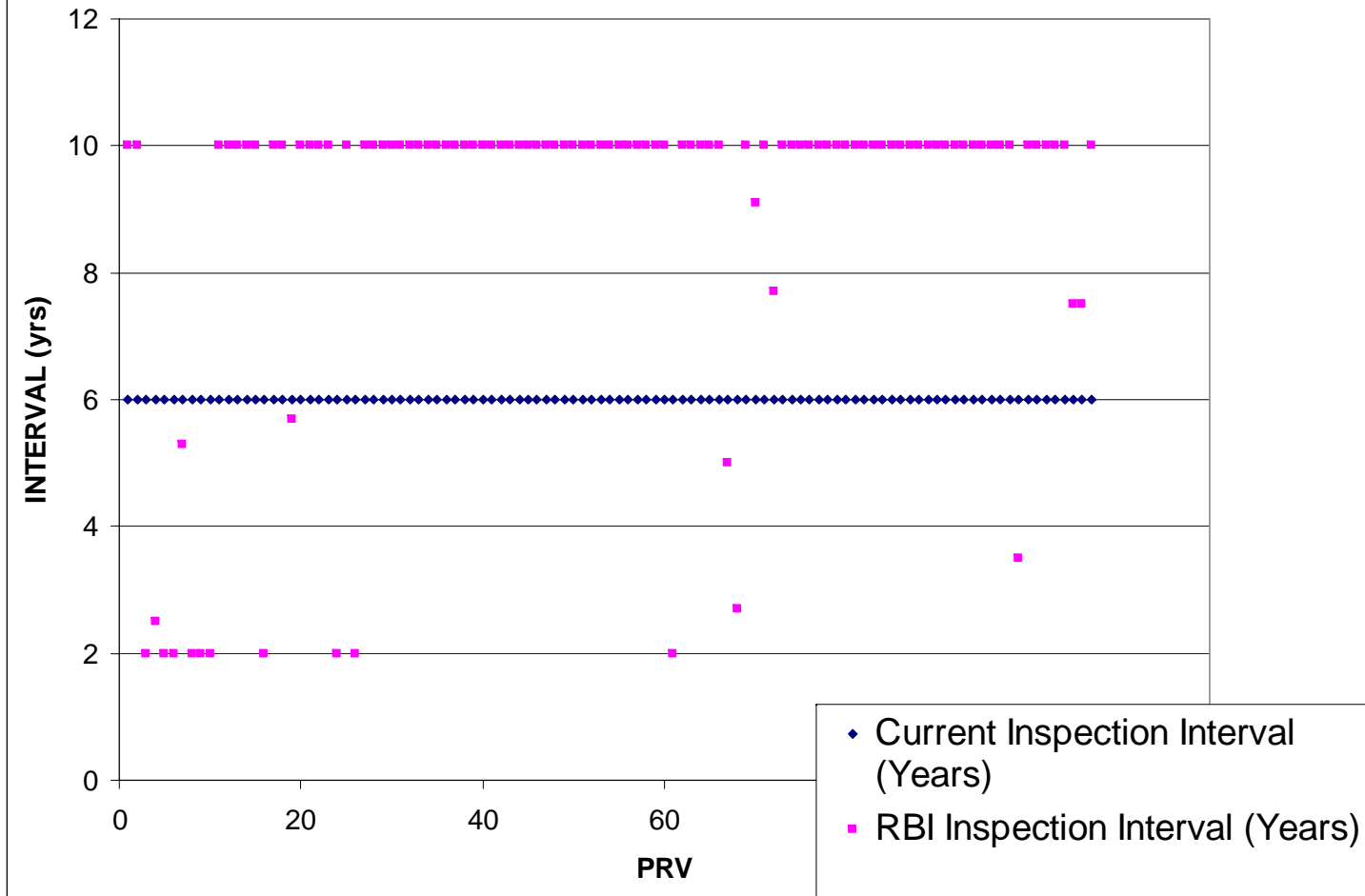
FHR PRD RBI PILOT PROJECT IN 38 UNIT GOHT



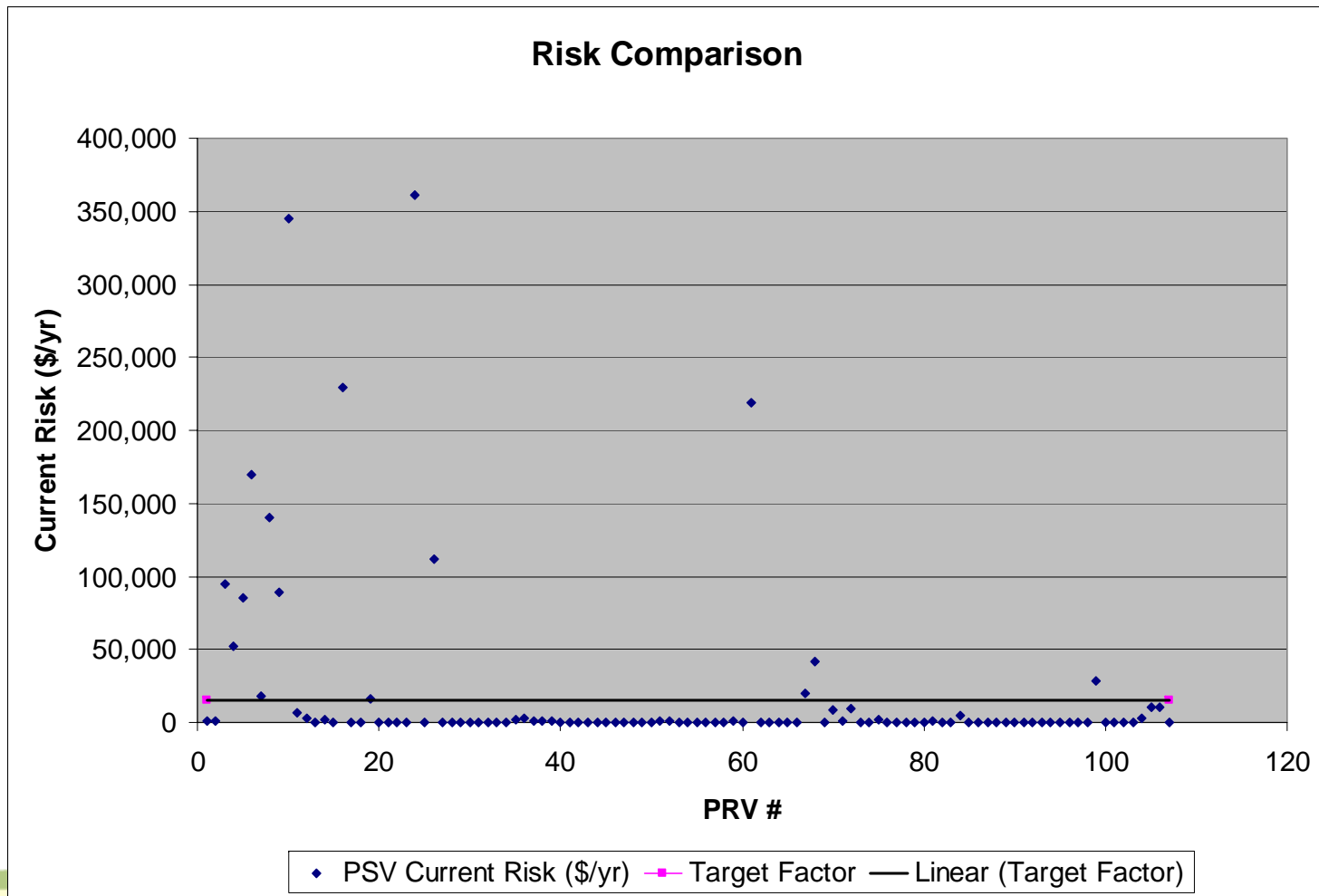
PRV Module Observations

- Of 107 relief valves evaluated:
 - 91 (85%) were extended to 10 years
 - 16 (15%) did not make the desired 6 yr TA interval
- Research into these 16 valves:
 - Appears to be related to high consequence fluid (H₂, H₂S)
 - Generally good inspection history
- Traditional program would have limited only 2 of these relief valves to less than 6 years.
- Inspection history does not have a significant impact on these high consequence PRV's

Traditional vs RBI PRV Intervals



- Large step change in risk
 - Top risk ranged from \$16,000-\$361,000
 - Lower risk ranged from 0-\$10,700



- Risk Targets were never achieved on 14 of the 16 high risk valves

2	PRD Tag	Protected Equipment	Fluid Service	(Years)	(\$/yr)	(Years)	(\$/yr)	Date	Insp Date	(\$/yr)
3	38PSV-009	38V-6 Cold Low Pressure Separator	C3-C4 036H2S	6	94,443	2	19,736	09/20/2005	09/22/2007	-74,707
4	38PSV-012	38V-11 MU Comp Suction Drum	H2	6	52,091	2.5	15,018	09/20/2005	03/05/2008	-37,073
5	38PSV-013	38V-12 MU Comp 2 nd Stg KO Drum	H2	6	85,693	2	15,496	09/20/2005	09/22/2007	-70,197
6	38PSV-014	38E-7B-SS MU Comp 1 st Stg Intercooler	H2	6	169,322	2	41,707	09/20/2005	09/22/2007	-127,615
7	38PSV-015	38E-8B-SS MU Comp 2 nd Stg Intercooler	H2	6	17,857	5.3	14,999	09/20/2005	01/11/2011	-2,858
8	38PSV-016	38V-13 MU Comp 3 rd Stg KO Drum	H2	6	140,061	2	26,269	09/20/2005	09/22/2007	-113,792
9	38PSV-017	38V-22A Pulsation Bottle 3 rd Stg Suct.	H2	6	88,882	2	17,665	09/20/2005	09/22/2007	-71,217
10	38PSV-018	38V-22B Pulsation Bottle 3 rd Stg Disch.	H2	6	344,744	2	83,314	09/20/2005	09/22/2007	-261,430
11	38PSV-030	38E-7A-SS MU Comp 1 st Stg Intercooler	H2	6	229,461	2	54,929	09/20/2005	09/22/2007	-174,532
12	38PSV-033	38E-8A-SS MU Comp 2 nd Stg Intercooler	H2	6	16,398	5.7	14,992	09/20/2005	05/23/2011	-1,406
13	38PSV-038	38V-23 Fractionator Preflash Drum	C3-C4 002H2S	6	361,530	2	52,751	09/20/2005	09/22/2007	-308,779
14	38PSV-040	38V-24 Fractionator	C6-C8 048H2S	6	111,595	2	22,444	09/20/2005	09/22/2007	-89,151
15	38PSV-100	38V-38 Stripper	H2S	6	219,165	2	48,580	06/13/2005	06/15/2007	-170,585
16	38PSV-116	38V-4A/B Cold High Pressure Separator	C1-C2 04H2S	6	20,126	5	15,004	09/20/2005	10/01/2010	-5,122
17	38PSV-117(OOS)	38V-26 Heavy Naphtha Stripper(OOS)	C9-C12 003H2S	6	41,998	2.7	15,001	05/05/2000	01/29/2003	-26,997
18	38PSV-167	38V-5 Hot Low Pressure Separator	C1-C2 03H2S	6	28,583	3.5	15,009	09/20/2005	03/31/2009	-13,574
19	TOTALS				2,021,949		472,914			-1,549,035

Recommendations Forward

- Investigate risk target values, may be too low
- Further understand the consequence modeling for PRV's – particularly light ends
- Investigate risk deductions - Lopa