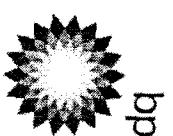


Engineering in E&P post Macondo

Paul Tooms – VP Engineering

Engineering in E&P

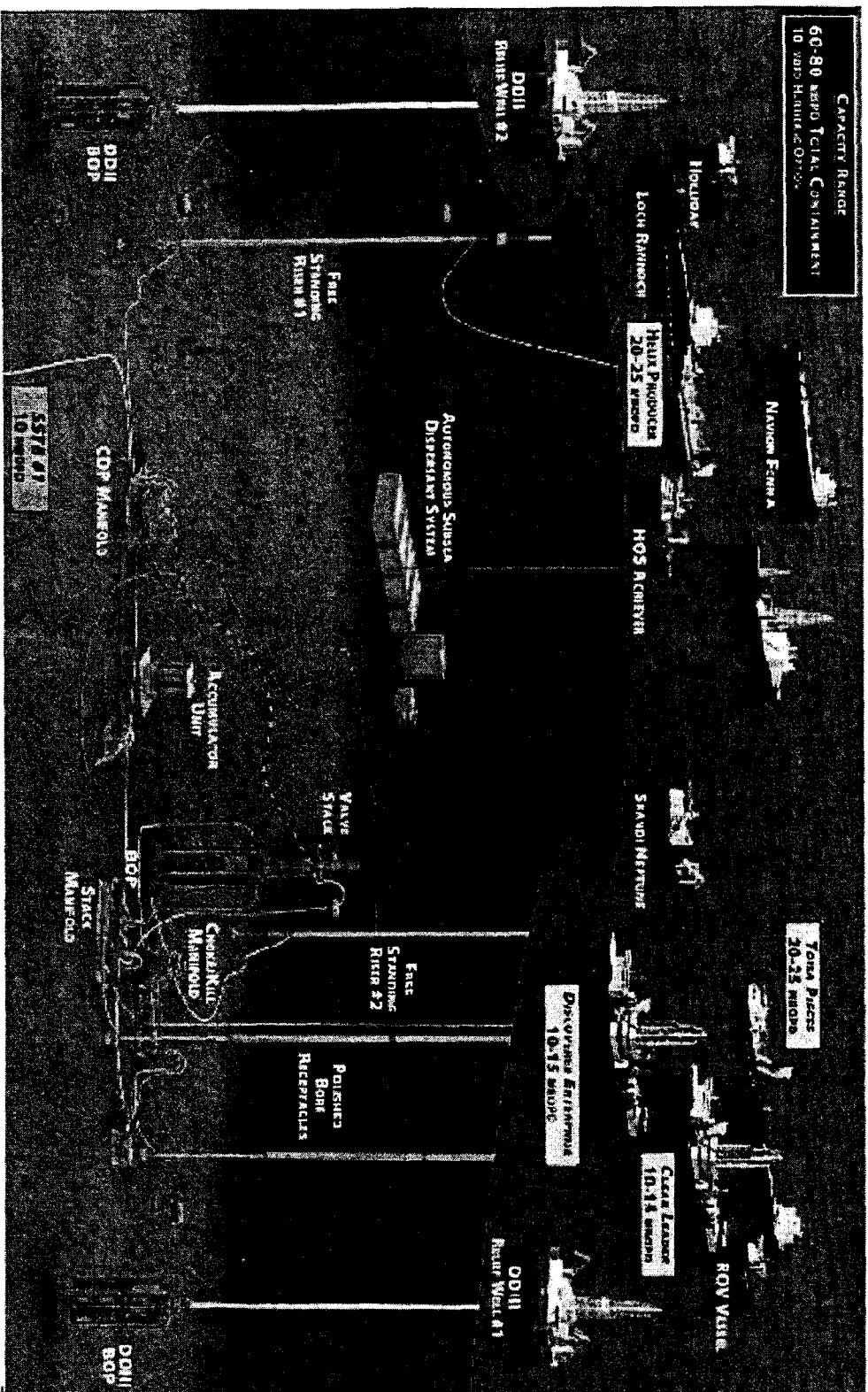


- Continue to follow the strategy and plan as laid out in Malta, re-inforced in Boston. Sharing
-> Learning.

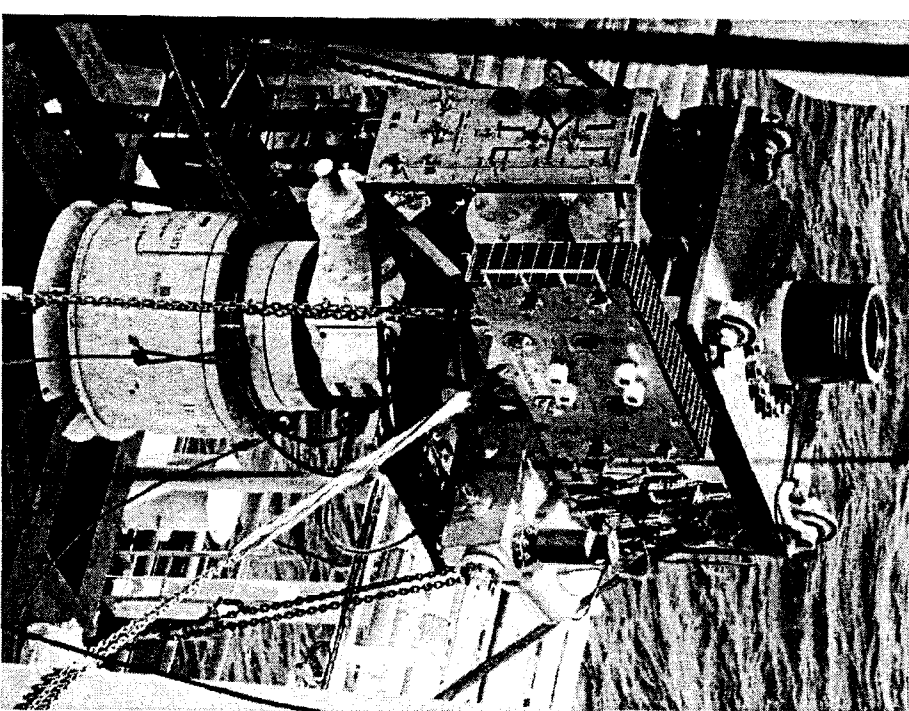
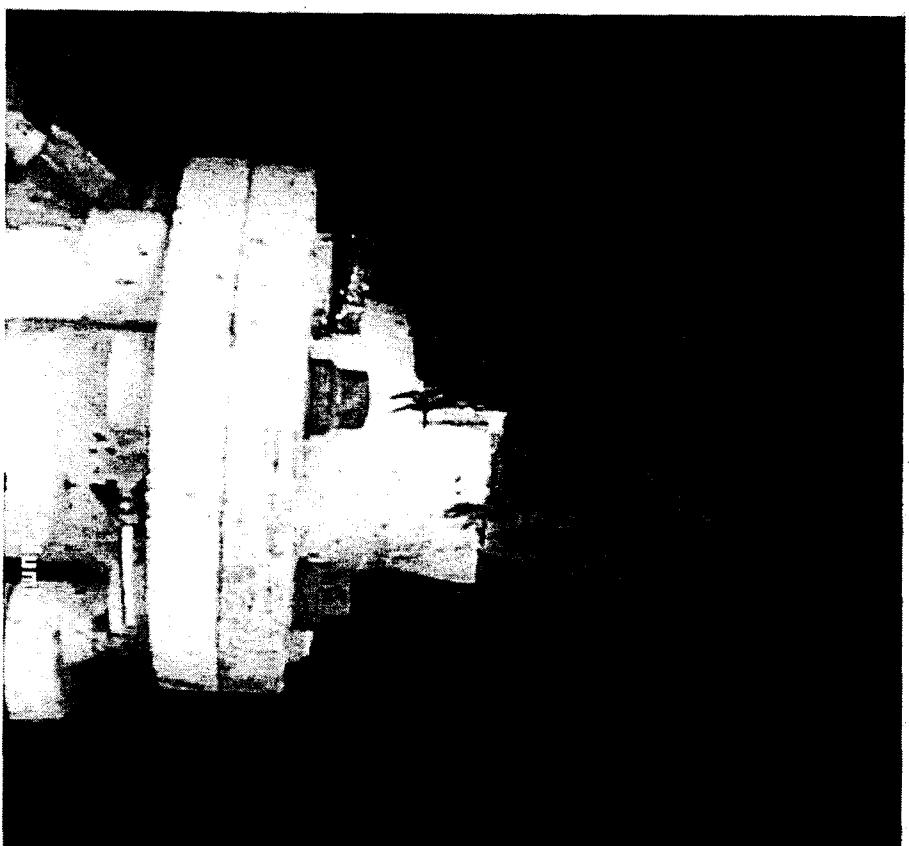
+

- Our biases
 - Make engineering in BP simple, reliable and effective
 - Engineer with rigour
 - Engineers to have impact
 - Engineering Authorities make the tough calls

Containment: Mid July Onwards
Capacity 60–80 mbd



Decomplexifying
- the capping stack



The need for Engineers to have impact

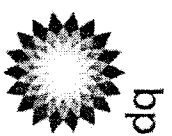
quotes from FT on July 16

The US government on Monday allowed BP to extend for 24 hours the containment cap shutting off the leak from the Macondo well

But US officials were quick to point out that it was up to them, not BP, whether the cap could stay in place.



Engineers had Impact



I was honored to have had the opportunity to work with and get to know all of you ...Inspired by your engineering team, with whom we worked with so closely Best Regards,

Margie Tatro - Sandia National Laboratory

On a personal note, I wanted to share my observations on the overall quality and extreme 'competence' of your entire staff during my connection to this activity. Their technical integrity and professionalism should be a source of pride to you and your staff

Rob Sharpe - Lawrence Livermore National Laboratory

2010 Production Division – S&O Risk Summary



Severity Level	1	2	3	4	5	6	7	8
	A similar event has not yet occurred in our industry and would only be a remote possibility	A similar event has not yet occurred in our industry	Similar event has occurred somewhere in our industry	Similar event has occurred somewhere within the BP Group	Similar event has occurred, or is likely to occur, within the lifetime of 30 similar facilities	Likely to occur once or twice in the facility lifetime	Event likely to occur several times in the facility lifetime	Common occurrence (at least annually) at the facility
A	3	9	10	11	12	13	14	15
B	7	8	9	10	11	12	13	14
C	6	7	8	9	10	11	12	13
D	5	6	7	8	9	10	11	12
E	4	5	6	7	8	9	10	11
F	3	4	5	6				
G	2							
H	1	2	3	4	5	6		
Frequency	$10^{1/yr}$ or lower	$>10^2$ to $10^{3/yr}$	$>10^4$ to $10^{5/yr}$	$>10^6$ to $10^{7/yr}$	$>10^8$ to $10^{9/yr}$	$>10^{10}$ to $10^{11/yr}$	$>10^{12}$ to $10^{13/yr}$	$>10^{14}$ to $10^{15/yr}$

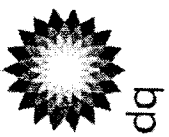
☐ Aviation
 ☒ Natural & Floating Systems
 ☐ Pipeline & Pipelines &
 ☐ Marine / Ship Collision
 ☐ Other

☐ Facility Process Safety (MAR)

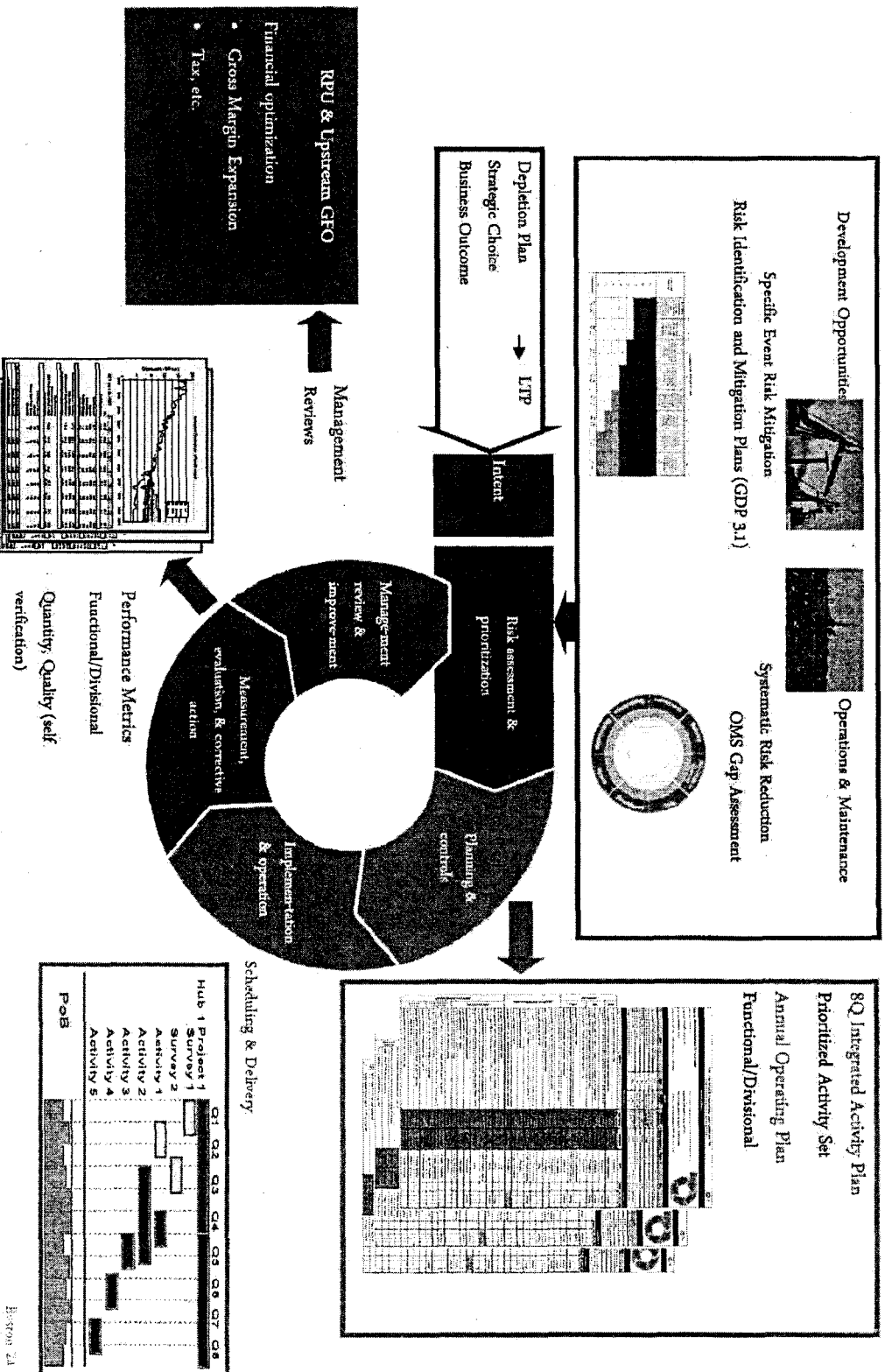


BACK UP

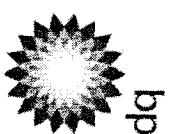
Performance Management in Context: The Performance Improvement Cycle (PIC)



Performance Improvement Cycle: Exists at both Segment and RPU Level



Simple, reliable, effective Engineering in BP



- Reduce / Avoid complexity
 - Simple elegant solutions are generally inherently safer
 - “Decomplexify”
- Remove buried conservatism
 - One engineers extra margin leads to another’s design challenge
 - Compounded conservatism leads to risks
- Develop & Apply appropriate standards
 - Thoughtful interpretation of ETPs
 - Challenge can be appropriate
 - Retrospective application will be defined as needed

Engineers to have impact

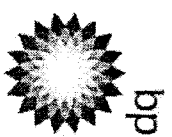
- Equip our engineers with the tools to be effective & have impact
 - Interpersonal skills
 - Influencing skills
 - Leadership
 - Problem solving (incl. Sense making)
- Persuasion + logic are the favoured tools of an engineer
 - But they are rarely effective in changing views
- Operators should understand their process and safe operating limits
 - Engineers need to act as coaches



Engineering with Rigour

- Engineers must know the discipline, be able to do the maths
- Write it down in sentences
 - Reports, not PowerPoint
 - “bullets can kill”
- BP Engineers make the decision, not EPPMS contractors
- We value individual expertise and judgement

Our Engineers will engender deep respect.



EA's

- EA's are the point at which the tough operational engineering decisions need to be taken
- EA's must be fully competent, confident able to exercise great judgement
- They must be valued by leadership (Divisional, Regional and Central)



Engineering Metrics

- Segment Recommended Practice for Engineering Management – section 8.1, E&P Segment Engineering Tier 1 metrics

