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Commercial Review of 8 Riser SLOR System

Magma m-pipe® versus steel pipe

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m-pipe® versus steel SLOR risers

Magma m-pipe® is an enabling subsea technology that can deliver a step change in riser systems, with a clear economic benefit for future deep water projects

Deep Water SLOR Cost Summary and Comparison – Steel versus m-pipe® Riser System

System of 8 x SLORs in 3,000m Water Depth	Steel SLOR (US$)	m-pipe m-SLOR (US$)	Steel SLOR oncost (%)	Steel SLOR oncost (US$)
Riser, jumper and pipe materials	224,855,400	226,126,208	-1 %	1,270,808
Equipment – buoyancy and connectors	67,298,000	36,269,501	86 %	31,028,499
Fabrication – piles, rigging and logistics	51,590,000	17,055,500	202 %	34,534,500
Engineering and Project Management	27,720,000	16,632,000	67 %	11,088,000
Offshore Construction	177,092,300	17,560,620	908 %	159,531,680
Construction all risks insurance	16,456,671	9,420,699	76 %	7,088,640
Total Cost for 8 x SLOR Riser System	**565,012,371**	**323,053,144**	**75 %**	**241,959,227**
Typical total project field development cost	**2,500,000,000**	**2,258,040,773**	**11 %**	**241,959,227**

- A steel SLOR riser has a 75% oncost (+$242m) vs. an m-pipe® m-SLOR riser system
- An m-pipe® m-SLOR riser system saves 11% versus a traditional steel SLOR riser project
- The much lighter weight of an m-pipe® m-SLOR riser offers significant technical benefits
- m-pipe® is also likely to be competitive versus a steel SLOR for shallower water depths

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m-pipe® riser cost benefits

Magma m-pipe® should be seriously considered on the basis of reducing costs and removing cost overrun risks for deep water multiple riser projects

- Minimal cost difference of m-pipe® m-SLOR riser and steel SLOR riser systems on total riser, jumper and pipe materials costs ($226m versus £225m)
- An m-pipe® m-SLOR does not require aircan Rotolatch connectors, flanges or fittings, and the total buoyancy can, connectors and tension monitoring costs are 86% more for a steel SLOR versus an m-pipe® m-SLOR ($67m versus $36m)
- The entire Upper Riser Assembly (URA) is not required with an m-pipe® m-SLOR, generating a $62m cost saving versus a steel SLOR riser
- The eight flexible jumpers are less than a third of the pipe length with an m-pipe® m-SLOR versus a steel SLOR, equating to a saving of over $81m
- Total m-SLOR riser fabrication costs are a third that of a steel riser ($17m vs. $52m)
- Some m-pipe® m-SLOR fabrication oncosts are offset by the $13m differential in pile costs between a steel SLOR and m-pipe ® m-SLOR ($17m versus $3m).
- A steel SLOR requires a fabrication allowance on J Lay spread that is not required with an m-pipe® m-SLOR, a saving of $29m including labour cost
- m-SLOR riser offshore construction costs are one tenth that of a steel SLOR riser

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m-pipe® riser project benefits

With m-pipe® it is expected riser construction can be undertaken in as short as three months versus seven months for steel SLORs, reducing cost and risk

- Potential cost overruns due to construction delays and missing weather windows are significantly greater due to heavy-lift vessels required for steel SLOR risers
- The type and size of vessel needed to transport and deploy steel SLOR risers are ten times the cost of transporting and deploying an m-pipe® m-SLOR
- There is a reduced requirement of project staff for m-pipe® m-SLOR deployment due to its lighter weight and easier handling (30 staff for m-pipe ® versus 50 staff for steel)
- The much smaller air cans required for an m-pipe® m-SLOR riser should result in significant reductions in inspection, repair and maintenance during operation
- There is the option for an m-pipe® riser manufacturing base to be established at relatively low cost in the local deployment region to increase local project content
- m-pipe® m-SLOR risers are able to utilise smaller, more readily available locally sourced vessels for more flexibility on the timing of riser deployment projects
- Unlike conventional non-bonded flexible jumpers, m-pipe® jumpers have a long design life that should exceed the life of the field, avoiding the need for replacement

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