## The role of microstructural development in the hydrothermal corrosion of cast and HIPed Stellite 6 (S-6) analogues in simulated PWR conditions

Table 1. Chemical composition (at. % and wt. %) of both cast and HIPed S-6 as measured by AMG Superalloys UK Limited, Rotherham, U.K.

Alloy	Composition								
		Co	Cr	W	С	Fe	Ni	Si	Mn
Cast S-6	at. %	51.7	31.2	1.5	6.6	3.0	2.6	2.9	0.5
	wt.%	55.9	29.7	5.1	1.5	3.0	2.8	1.5	0.5
HIPed S-6	at. %	59.8	29.5	1.7	4.5	0.7	0.8	2.9	0.1
	wt.%	63.0	27.4	5.4	1.0	0.7	0.9	1.5	0.1

Table 2. EDX analyses of the proportion of metallic elements in the three main phases in cast S-6 (at%) presented as average values from five individual measurements.

	Composition (at%)					
Element	Co-rich	Cr-rich	W-rich			
	matrix	carbide	carbide			
Si	4.4	0.1	8.9			
Cr	26.3	83.4	34.6			
Fe	3.2	1.5	1.4			
Со	60.3	12.9	35.1			
Ni	2.9	0.8	1.9			
W	2.9	1.3	18.1			
Total	100.0	100.0	100.0			

Table 3. EDX analyses of the proportion of metallic elements in the two main phases in HIPed S-6 (at%).

	Composition (at. %)			
Element	Co-rich	Cr-rich		
	matrix	carbide		
Si K	3.5	0.0		
Cr K	25.2	85.4		
Fe K	0.9	0.2		
Co K	67.6	13.2		
Ni K	1.0	0.1		
W M	1.8	1.1		
	100.0	100.0		

Table 4 Equilibrium prediction of the composition of the Co fcc and  $M_7C_3$  phases in HIPed S-6 at the HIPing temperature of 1200°C

ng temperature of 1200°C	
	Co fcc
Component	At %
Со	68.5
Cr	24.0
W	1.6
Si	3.5
Ni	1.0
Fe	0.8
Mn	0.1
С	0.5
	M <sub>7</sub> C <sub>3</sub>
Component	At %
Cr	63.1
С	30.0
Co	5.3
W	1.4
Fe	0.1
Ni	0.0
Mn	0.0
Si	0.0