T73S03 Session 44B Homework

Mentor Guide Questions

1.17 Discuss the inputs required for an assessment (including: effective historical creep temperature; future temperature; rate of cycling; assessment period; stress classification; defect idealisation; relevant materials/zones to be assessed, etc)

1.18 Define the elastic follow-up factor, Z, and state two ways in which the value of Z for a crack growth assessment to R5V4/5 may differ from that for an initiation assessment to R5V2/3.

1.19 Itemise the key materials data required in an R5 creep-fatigue crack growth assessment

1.20 Describe the cyclic stress-strain behaviour of structural metals. State how this behaviour might change due to (a) repeated cycling, or, (b) prolonged exposure to high temperatures.

1.21 Define “strict shakedown” and “global shakedown”. Discuss how these might influence creep-fatigue crack growth, and how this is incorporated into the R5 procedure

1.22 Identify the provisions within R5 specific to displacement controlled loading.

1.23 Discuss which material properties may be affected by prolonged exposure to high temperatures.

1.24 Discuss qualitatively the distinction between creep-brittle and creep-ductile behaviour with respect to the characteristics of how cracks form and grow.

1.70 Discuss best practice in terms of what results should be presented, what sensitivity studies may be desirable, and the relevance of validation evidence to the reliability of the results.