

# **RSE-M**

## **IN-SERVICE INSPECTION RULES FOR MECHANICAL COMPONENTS OF PWR NUCLEAR ISLANDS.**

**2017 EDITION**

**1<sup>st</sup> Erratum – October 2020**

**Afcen**

French Association  
for Design, Construction  
and In-Service Inspection Rules for  
Nuclear Island Components

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## **NOTE TO THE USERS**

This document proposes modification which correspond to a translation error in the RSE-M 2017 English edition.

The following page is to be replaced:

- Volume II – Appendix 5.4 – Page 31

If  $L_r^* < L_r \leq 1$ , a new value for  $K_r$  is determined by a linear interpolation between  $K_r(L_r^*)$  and  $K_r(L_r=1)$ :

$$K_r = K_r(L_r^*) + \frac{K_r(L_r = 1) - K_r(L_r^*)}{1 - L_r^*} (L_r - L_r^*)$$

where

$$K_r(L_r^*) = \left\{ \frac{E \varepsilon_{\text{ref}} (L_r^* S_y)}{L_r^* S_y} + 0.5 \frac{(L_r^*)^2}{(L_r^*)^2 + 1} \right\}^{-\frac{1}{2}}$$

and

$$K_r(L_r = 1) = \left\{ \frac{E \varepsilon_{\text{ref}} (S_y)}{S_y} + 0.25 \right\}^{-\frac{1}{2}}$$

d)  $J$  is calculated by the formula:

~~$$K_J = \frac{\sigma_{\text{nor}}}{\sigma_{\text{no}}} \cdot \left[ \psi + \frac{\varepsilon_{\text{ref}}}{\sigma_{\text{ref}}/E} \right]$$~~

$$J_s = J_{el} \cdot \frac{1}{K_r^2}$$

#### IV.4.1.1.2 $J_s$ CLC OPTION – STRAIGHT PIPE - LONGITUDINAL SURFACE BREAKING DEFECT

a)  $L_r$  is calculated using the following expression:

$$L_r = \sqrt{\left[ \frac{p}{q_p \mu_{ep}} \right]^2 + \left[ \frac{m_1}{q_p \mu_{em1}} \right]^2 + \left[ \frac{m_2}{q_m} \right]^2}$$

where  $p$ ,  $n_1$ ,  $m_1$  and  $m_2$  are normalized loads:

$$p = \frac{\sqrt{3} P r_m}{2 t S_y} \quad m_1 = \frac{\sqrt{3} M_1}{2 \pi r_m^2 t S_y} \quad m_2 = \frac{M_2}{4 r_m^2 t S_y}$$

$P$ : internal pressure       $M_1$ : torsional moment       $M_2$ : bending moment

- if  $m_2 \neq 0$  and  $p \leq 0.5$ , this expression is valid for  $L_r \leq 1.4$ ;
- if  $m_2 \neq 0$  and  $p > 0.5$ , this expression is valid for  $L_r \leq 1.2$ .

If only the applied moment modulus  $|M|$  is known, it is assumed that:  $M_1 = |M|$  and  $M_2 = 0$ .

The significance and value of coefficients  $q_m$ ,  $q_p$ ,  $\mu_{em1}$  and  $\mu_{ep}$  are given in compendium (VII).