LOGARITHMIC GROWTH OF PASSIVE FILMS

CURRENT DURING FILM GROWTH
$I = I_F + I_D$ (NONSTATIONARY), SELECTIVE DISSOLUTION

$I = I_D$ (STATIONARY)

BILAYER FILM

INNER LAYER, OXIDE FILM Cr_2O_3
OUTER LAYER, HYDROXIDE $Cr(OH)_3$

HYDROXIDE – STABILIZE THE PASSIVE FILM

AGING EFFECT - DECREASE OF DEFECTS

SIMULATION OF CORROSION IN REPOSITORY

SPECIMEN FULLY IMMERSED IN SOLUTION
IN VAPOR PHASE (ABOVE THE WATER LINE)

CORROSION OCCURS IN A LIQUID-PHASE LAYER
ON THE METAL SURFACE

DIFFERENT COMPOSITION OF A LIQUID-PHASE
AS A RESULT OF EVAPORATION, SALT PRECIPITATION,
HUMIDITY, AIR FLOW, TEMPERATURE

THICKNESS AND COMPOSITION OF LIQUID-PHASE
DEPENDS UPON ABOVE PARAMETERS

LOCALIZED CORROSION:

REPASSIVATION POTENTIAL FOR CREVICE AND REPASSIVATION PITTING POTENTIAL CRITERIONS ARE VALID TO DETERMINE WHETHER LOCALIZED CORROSION WILL OR WILL NOT OCCUR