ERREU10 - Validation of the stop for instability in STAT_NON_LINE

Summary:

This test validates the management of the stop on detection of instability in STAT_NON_LINE. For that one takes as a starting point the CAS-test SSLL105 where an instability of type buckling is observed.
1 Principle of the test

This test comprises only one modeling where one reiterates one of the resolutions non-linear of CAS-test SSLL105D. At the time of the call to STAT_NON_LINE, an instability of buckling occurs and one will check here that the associated exception is well intercepted and that the test finishes properly: the base being correctly closed and would be thus exploitable in continuation.

This mode of stop on instability, that it is in STAT_NON_LINE or DYNA_NON_LINE, starts while declaring in DEFI_LIST_INST an event of the type ‘INSTABILITY’ associated with the action ‘STOP’. Without this specific argument, the code, in its by default mode, will try to continue calculation even in the presence of instability: the non-linear algorithm follows a branch of solution then.

In practice, one will test the three possibilities of criterion of instability, which are defined via the value associated with the keyword SIGN under CRIT_STAB in STAT_NON_LINE [U4.51.03]. The critical load, during non-linear calculation, initially is superior to 2 and decrease to become inferior to the Eure with 1: there is thus well an instability by values positive.

Thus if the criterion of stop regards as unstable any computed value ranging between -1 and 1 (SIGN = ‘POSITIF_NEGATIF’) then calculation must stop well because of the event ‘INSTABILITY’ of DEFI_LIST_INST. If this criterion considers unstable the critical loads understood enters 0 and 1 (SIGN = ‘POSITIF’), one will have also the same type of stop.

On the other hand, one tests that if the criterion of stop is based on the interval of instability -1 with 0 (SIGN = ‘NEGATIF’), then non-linear calculation must continue until the end of its list of moments.