Code_Aster

Version default

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Date : 07/04/2009 Page : 1/18
Clé : U4.84.05   Révision : 475

Operator POST_USURE

1   Drank

Compute volume and depth of wear according to the power of wear.

The power of wear is given or calculated by the operator `DYNA_TRAN_MODAL` [U4.53.21]. It is necessary to provide a law of attrition, a geometry of contact and a list of times.

The figure of clearance can be cut out to compute: the quantities related to wear by sectors. In this case, the array created can be used by the operator `MODI_OBSTACLE` [U4.44.22] to compute: the evolution of the figures of clearances due to wear.

Product a data structure of the table_sdaster `type`.

Code_Aster

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Version
default

Date : 07/04/2009 Page : 2/18
Clé : U4.84.05 Révision : 475

2 Syntax

```
tresu [table_sdaster]   =POST_USURE         (


    # definition of the Node of impact or a power of wear
           ♦ /♦     RESU_GENE=tg      ,
[tran_gene]
               ♦  NOEUD    =noeu  ,                          [node]
             ◊INST_INIT=/0           .,
[DEFAULT]
                             /t0 ,                           [R]
             ◊INST_FIN  =t1 ,                                [R]
             ◊NB_BLOC=/1          ,
[DEFAULT]
                             /nb ,                           [I]

        /♦PUIS_USURE=pu             ,                        [R]


    # definition of law of attrition
                       ♦ /♦LOI_USURE=' ARCHARD',             [kN]
           /♦MOBILE=_F           (
                             ♦COEF_USURE   = k_t,    [R]
                      ),
              ◊OBSTACLE=_F         (
                             ♦COEF_USURE   = k_o,    [R]
                      ),
           /♦MATER_USURE=              `mat1_mat2',           [kN]
              ◊USURE_OBST=/         "NON",             [DEFAULT]
                             / "OUI',
    # division the figure of clearance in sectors
           /♦SECTEUR      =_F    (
               ♦COEF_USURE_MOBILE=k_t        ,        [R]
               ♦   COEF_USURE_OBST=k_o             ,         [R]
               ♦                CONTACT=' type',      [kN]
               ◊  ANGL_INIT=ang_i                  ,         [R]
               ♦  ANGL_FIN=ang_f                   ,         [R]
                      ),

        /   ♦       LOI_USURE=' KWU_EPRI',             [kN]
           /♦MOBILE=_F              (
                             ♦COEF_FNOR=k1_t         ,  [R]
                             ♦   COEF_VTAN=k2_t      ,  [R]
                             ♦COEF_USURE=k3_t    ,   [R]
                             ◊COEF_K=/        k_t,   [R]
                                      /5. ,  [DEFAULT]
                             ◊COEF_C=/        c_t,   [R]
                                      /10. , [DEFAULT]
                      ),
```

Code_Aster

Version default

Titre : Opérateur POST_USURE　　　　　　　　*Date : 07/04/2009 Page : 3/18*
Responsable : Nicolas BRIE　　　　　　　　　　*Clé : U4.84.05　　Révision : 475*

```
                      ◊OBSTACLE=_F          (
                                            ♦COEF_FNOR=k1_o          ,        [R]
                                            ♦COEF_VTAN=k2_o          ,        [R]
                                            ♦   COEF_USURE=k3_o ,        [R]
                                            ◊   COEF_K=/         k_o,    [R]
                                                         /5. ,
[DEFAULT]

                                            ◊   COEF_C=/         c_o,    [R]
                                                         /10. ,
[DEFAULT]
                                 )
                    /    ♦   MATER_USURE=      `mat1_mat2',            [kN]
                         ◊   USURE_OBST=/     "NON",                [DEFAULT]
                                          /  "OUI',
                  ◊   FNOR_MAXI=fn    ,                          [R]
                  ◊   VTAN_MAXI=vg    ,                          [R]

                     /♦LOI_USURE=' EDF_MZ',
[kN]
              /♦MOBILE=_F             (
                                      ♦COEF_USURE= /a_t,      [R]
                                                  /1.E-13,
[DEFAULT]

                                      ◊   COEF_B   =/b_t,     [R]
                                                   /1.2,
[DEFAULT]

                                      ◊COEF_N       =/n_t,        [R]
                                                    /2.44E-08,
                                      ◊   COEF_S    =/s_t,     [R]
                                                    /1.14E-16,
                                  ),
              ◊OBSTACLE=_F         (
                                    ♦COEF_USURE=/a_o,     [R]
                                               /1.E-13,
[DEFAULT]

                                    ◊   COEF_B   =/ b_o,      [R]
                                                /1.2,
[DEFAULT]

                                    ◊   COEF_N   =/n_o,       [R]
                                                /2.44E-08,
                                    ◊   COEF_S   =/s_o,       [R]
                                                /1.14E-16,
                                 ),
              /♦MATER_USURE=               `mat1_mat2',            [kN]
                 ◊USURE_OBST=/         "NON",
[DEFAULT]
                                     /  "OUI',

    # definition of times of computation depth of wear
         ♦/INST=l_inst               ,                [l_R]
           /LIST_INST          =linst   ,
[listr8]

           /COEF_INST          =coef ,                          [R]

    # definition of a title
         ◊TITER =  ' montitre',                        [l_Kn]

    # printing of information
         ◊INFO=/1                ,                       [I]
```

Code_Aster

Version default

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Date : 07/04/2009 Page : 4/18
Clé : U4.84.05   Révision : 475

```
                                /2  ,
        [DEFAULT]
```

Code_Aster

Version default

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Date : 07/04/2009 Page : 5/18
Clé : U4.84.05   Révision : 475

```
          # definition of the array to enriching in the case of computation with
          evolution # of clearances
                ◊ETAT_INIT    =_F    (
                    ♦TABL_USURE   =tresu   ,
[table_sdaster]
                    ◊INST_INIT        =tout ,                              [R]
                          ),

        # definition of the contact
            ♦/♦CONTACT              =     ' GRAPPE_ALESAGE',             [kN]
                    ♦RAYON_MOBILE =r_t  ,                            [R]
                    ♦RAYON_OBST     =r_o    ,                           [R]

            /♦CONTACT           =     ' GRAPPE_1_ENCO',              [kN]

            /♦CONTACT           =     ' GRAPPE_2_ENCO',              [kN]

            /♦     CONTACT       =     ' TUBE_BAV',              [kN]
                    ♦RAYON_MOBILE =r_t       ,                       [R]
                    ♦LARGEUR_OBST =l_o       ,                       [R]
                    ◊   ANGL_INCLI   =angl  ,                         [R]

            /♦     CONTACT       =     ' TUBE_ALESAGE',            [kN]
                    ♦RAYON_MOBILE =r_t  ,                            [R]
                    ♦RAYON_OBST     =r_o        ,                           [R]
                    ♦LARGEUR_OBST =l_o      ,                        [R]
                    ◊   ANGL_INCLI   =angl  ,                         [R]

            /♦CONTACT           =     ' TUBE_3_ENCO',               [kN]
                    ♦RAYON_MOBILE =r_t  ,                            [R]
                    ♦RAYON_OBST     =r_o        ,                           [R]
                    ♦LARGEUR_OBST =l_o       ,                       [R]
                    ♦   ANGL_ISTHME  =angli ,                        [R]
                    ◊   ANGL_INCLI   =angl  ,                         [R]

            /♦CONTACT           =     ' TUBE_4_ENCO',               [kN]
                    ♦RAYON_MOBILE =r_t  ,                            [R]
                    ♦RAYON_OBST     =r_o       ,                           [R]
                    ♦LARGEUR_OBST =l_o      ,                        [R]
                    ♦   ANGL_ISTHME  =angli ,                        [R]
                    ◊   ANGL_INCLI   =angl  ,                         [R]

            /♦                    CONTACT=' TUBE_TUBE',             [kN]
                    ♦RAYON_MOBILE=r_t                ,                 [R]
                    ◊ANGL_INCLI=angl                 ,                 [R]

# loading of a tube nine
                              /◊TUBE_NEUF=' OUI'
[DEFAULT]

                    )
```

Code_Aster

Version default

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Date : 07/04/2009 Page : 6/18
Clé : U4.84.05   Révision : 475

3   Operands

We attract it hereattention on some delicate points of the use of POST_USURE.

1) Result on POST_USURE does not depend on the final mechanical state of computation but of all the history of the shocks. It is thus very important to take into account **all** times of computations, i.e. not to ask selective archivage in DYNA_TRAN_MODAL.

2) Result of POST_USURE is very sensitive to the parameters of computations, in particular with the wealth of modal base, and time step. It is thus strongly advised to test various modal bases time step (increasingly rich) and different (increasingly small). For example, for time step, one will be able to test various spaced values of a factor 10, then 2, in order to determine a beach of time step on which result is stable.

3) In the case of a vibratory computation, one can have result who is not representative of real wear if the experiment is not long enough. In the same way, in the case of excitations generated by chance, it is advised to carry out several pullings before drawing the conclusions of design.

3.1   Node of impact and power of wear

3.1.1   Operand PUIS_USURE

♦PUIS_USURE   = been able

the power of wear is:

*   exit of result of a transient computation by modal recombination, by the operator produces DYNA_TRAN_MODAL [U4.53.21] (operands following),
*   or given by the user which uses operand PUIS_USURE then.

3.1.2   Operand RESU_GENE

♦   RESU_GENE = tg

Résultat of a transient computation by modal recombination, produces DYNA_TRAN_MODAL [U4.53.21] by the operator.

3.1.3   Operand NOEUD

♦NOEUD = noeu

Definition of the node of shock to post-treating.

3.1.4   Operand INST_INIT

◊INST_INIT   = t0

Instant of beginning of the average of the signals (cf [§4]).
(t0 = 0. value by default).

3.1.5   Operand INST_FIN

◊INST_FIN = Urgent

T1 of end of the average of the signals.

3.1.6   Operand NB_BLOC

◊NB_BLOC   = Nb

Many temporal blocks of division interval [t0, T1] for the average of the signals (1 per default).

Code_Aster

Version
default

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Date : 07/04/2009 Page : 7/18
Clé : U4.84.05   Révision : 475

3.2 Law of attrition "ARCHARD" [bib5]

3.2.1 Operand LOI_USURE

♦LOI_USURE   =   ' ARCHARD'

Defines the law of attrition in order to calculate worn volume.

The coefficient of wear of the model of Archard [bib5] is provided by the user or is taken in a data base.

3.2.2 Key word MOBILE

♦MOBILE

Definition of the coefficient of wear of the mobile.

3.2.2.1 Operand COEF_USURE

♦COEF_USURE   =k_t

Value of the coefficient of wear of the mobile.

3.2.3 Key word OBSTACLE

◊OBSTACLE

Definition of the coefficient of wear of the obstacle.

3.2.3.1 Operand COEF_USURE

♦COEF_USURE   =k_o

Value of the coefficient of wear of the obstacle.

3.2.4 Operand MATER_USURE

♦MATER_USURE = "mat1_mat2"

Recovery of the coefficients in a bank of data:

mat1: being the material of the cluster or tube (the mobile),
mat2: being the material of the obstacle.

3.2.5 Operand USURE_OBST

◊USURE_OBST   =   "YES"
                  /   "NON"   [DEFAULT]

Indicates if one wants to take into account the wear of the obstacle.

3.3 Law of attrition "KWU_EPRI" [bib5]

3.3.1 Operand LOI_USURE

♦LOI_USURE   =   ' KWU_EPRI'

Defines the law of attrition in order to calculate worn volume.

3.3.2 Key word MOBILE

♦MOBILE

Definition of the coefficient of wear of the mobile (provided by the user or taken in data base).

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Code_Aster

Version
default

Date : 07/04/2009 Page : 8/18
Clé : U4.84.05   Révision : 475

3.3.2.1 Operands COEF_*

♦COEF_FNOR   =k1_t

Definition of the dimensional coefficient of correction in the case of pure impacts.

♦COEF_VTAN   =k2_t

Definition of the dimensional coefficient of correction in the case of slidings.

♦COEF_USURE=k3_t

Definition of the coefficient of wear of reference.

◊COEF_K   =/k_t
          /5 .   [DEFAULT]

Definition of the constant.

◊COEF_C   =/c_t
          /10 .   [DEFAULT]

Definition of the constant.

3.3.3 Key word OBSTACLE

◊OBSTACLE

Definition of the coefficient of wear of the obstacle (provided by the user or taken in data base).

3.3.3.1 Operands COEF_*

♦COEF_FNOR   =k1_o

Definition of the dimensional coefficient of correction in the case of pure impacts.

♦COEF_VTAN   =k2_o

Definition of the dimensional coefficient of correction in the case of slidings.

♦   COEF_USURE=k3_o

Definition of the coefficient of wear of reference.

◊   COEF_K =/k_o
          /5 .   [DEFAULT]

Definition of the constant.

◊   COEF_C =/c_o
          /10 .   [DEFAULT]

Definition of the constant.

3.3.4 Operand MATER_USURE

♦MATER_USURE = "mat1_mat2"

Recovery of the coefficients in a bank of data =

mat1 = being the material of the cluster or of the tube (the mobile),
mat2 = being the material of the obstacle.

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Code_Aster

Version
default

Date : 07/04/2009 Page : 9/18
Clé : U4.84.05 Révision : 475

3.3.5 Operand USURE_OBST

◊USURE_OBST = "YES"
/ "NON" [DEFAULT]

Indicates if one wants to take into account the wear of the obstacle.

3.3.6 Operands FNOR_MAXI/VTAN_MAXI

◊FNOR_MAXI = fn

Définition of the maximum normal force to take into account for the distribution of the 5 classes for law of attrition KWU_EPRI.

◊VTAN_MAXI =vg

Definition velocity of sliding maximum to take into account for the distribution of the 5 classes for law of attrition KWU_EPRI.

3.4 Law of attrition "EDF_MZ" [bib5]

3.4.1 Operand LOI_USURE

♦LOI_USURE = ' EDF_MZ'

Defines the law of attrition in order to calculate worn volume.

3.4.2 Key word MOBILE

♦MOBILE

Definition of the coefficient of wear of the mobile (provided by the user or taken in data base).

3.4.2.1 Operands COEF_*

♦COEF_USURE =/a_t
/1.E-13 [DEFAULT]

Definition of the coefficient of wear A.

◊COEF_B =/b_t
/1.2 [DEFAULT]

Definition of the exhibitor of the power of wear B.

◊COEF_N =/n_t
/2.44E-08 [DEFAULT]

Definition of the rate of deceleration N.

◊COEF_S =/S_t
/1.14E-16 [DEFAULT]

Definition of the threshold S.

Code_Aster

Version
default

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Date : 07/04/2009 Page : 10/18
Clé : U4.84.05 Révision : 475

3.4.3 Key word OBSTACLE

◊OBSTACLE

Definition of the coefficient of wear of the obstacle (provided by the user or taken in data base).

3.4.3.1 Operands COEF_*

♦COEF_USURE   =/a_o
                /1.E-13   [DEFAULT]

Definition of the coefficient of wear A.

◊COEF_B   =/b_o
              /1.2   [DEFAULT]

Definition of the exhibitor of the power of wear B.

◊COEF_N   =/n_o
              /2.44E-08   [DEFAULT]

Definition of the rate of deceleration N.

◊COEF_S   =/s_o
              /1.14E-16   [DEFAULT]

Definition of the threshold S.

3.4.4 Opérande MATER_USURE

♦MATER_USURE = "mat1_mat2"

    Recovery of the coefficients in a bank of data =

        mat1 = being the material of the cluster or of the tube (the mobile),

        mat2 = being the material of the obstacle.

3.4.5 Operand USURE_OBST

◊USURE_OBST   =   "YES"
                    /   "NON"   [DEFAULT]

Indicates if one wants to take into account the wear of the obstacle.

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Code_Aster

Version
default

Date : 07/04/2009 Page : 11/18
Clé : U4.84.05 Révision : 475

3.5 Operand CONTACT

♦CONTACT = géom

Definition of the geometry of contact.

According to the type of contact, various geometrical relations between volumes used and the worn depths.

3.5.1 Operand CONTACT = "GRAPPE_ALESAGE"

the cluster is centered in a boring. The trace of wear has a section in the shape of lunule. Worn volume is brought back to an area used in a section.

3.5.2 Operand CONTACT = "GRAPPE_1_ENCO"

the cluster is centered compared to the obstacle.

The card of guidance is made of a notch. Worn volume is brought back to an area used in a section.

The coefficients are founded at the same time on the experimental results and those of feedback. They apply only to the control rods.

3.5.3 Operand CONTACT = "GRAPPE_2_ENCO"

the cluster is centered compared to the obstacle.

The card of guidance is made of two notches diametrically opposite. Worn volume is brought back to an area used in a section.

The coefficients are founded at the same time on the experimental results and those of feedback. They apply only to the control rods.

3.5.4 Operand CONTACT = "TUBE_BAV"

Case 1:

The tube is presented vertically, the bar impacts perpendicular to the tube, one supposes that the bar does not wear (USURE_OBST = "NON").

Case 2:

The bar is presented tilted (operand ANGL_INCLI) compared to the tube, the bar impacts perpendicular to the tube, one supposes that the bar does not wear.

Case 3:

The tube is presented vertically, the bar impacts perpendicular to the tube, one takes into account the wear of the bar (USURE_OBST = "OUI').

Case 4:

The bar is presented tilted (operand ANGL_INCLI) compared to the tube, the bar impacts perpendicular to the tube, one takes into account the wear of the bar.

Code_Aster

Version
default

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Date : 07/04/2009 Page : 12/18
Clé : U4.84.05   Révision : 475

3.5.5 Operand CONTACT = "TUBE_ALESAGE"

Case 1:

The tube is centered perfectly in an animated boring of a pure orbital motion and wears in a uniform way on all the periphery in contact with the obstacle.

Case 2:

The tube is centered in an animated boring of a motion of impact-slidings of the elliptic type which leads to the training of traces of wear of the cylindrical type diametrically opposite on the tube and having a section in the shape of lunule.

Case 3:

The tube, animated of a motion of impact-slidings, presents this time a slope compared to the support (operand ANGL_INCLI). One obtains two symmetric traces of wear in form of V on the tube.

3.5.6 Operand CONTACT = "TUBE_3_ENCO"

Case 1:

The initial contact is carried out against an edge of one of the isthmuses of a trifoliate boring. One supposes the tube perfectly centered compared to his obstacle. The trace of wear does not extend to the entire isthmus. One does not take into account the wear of the obstacle.

Case 2:

Same assumptions as for case 1 except the position of the tube compared to the obstacle. One supposes this time that the tube presents an angle of inclination (operand ANGL_INCLI).

3.5.7 Operand CONTACT = "TUBE_4_ENCO"

Case 1:

The initial contact is carried out against an edge of one of the isthmuses of quadrifoliate boring. One supposes the tube perfectly centered compared to his obstacle. The trace of wear does not extend to the entire isthmus. One does not take into account the wear of the obstacle.

Case 2:

Same assumptions as for case 1 except the position of the tube compared to the obstacle. One supposes this time that the tube presents an angle of inclination (operand ANGL_INCLI).

3.5.8 Operand CONTACT = "TUBE_TUBE"

Following the fracture of a stopped tube, it can have there contact between this tube and one of its neighbors. The wear of the two tubes by accommodation of surfaces in contact led to the creation of two plane surfaces.

Code_Aster

Version
default

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Date : 07/04/2009 Page : 13/18
Clé : U4.84.05 Révision : 475

3.6 Operand RAYON_MOBILE

♦RAYON_MOBILE = r_t

Definition of the radius of the mobile (compulsory parameter).

3.7 Operand RAYON_OBST

♦RAYON_OBST = r_o

Definition of the radius of the obstacle (compulsory parameter if the wear of the obstacle is taken into account).

3.8 Operand LARGEUR_OBST

♦LARGEUR_OBST = l_o

Definition of the width of the obstacle (compulsory parameter for operands TUBE_*).

3.9 Operand ANGL_INCLI

◊ANGL_INCLI = Eng

Definition of the angle of inclination mobile/obstacle (optional parameter = value 0. is taken by default).

3.10 Operand ANGL_ISTME

♦ANGL_ISTHME = angli

Definition of the angle of the isthmus of the geometry of contact (compulsory parameter for operands TUBE_3_ENCO and TUBE_4_ENCO).

3.11 Operands INST/LIST_INST/COEF_INST

♦INST = l_inst

Definition of times of computation in the shape of a list of values.

♦LISTE_INST = linst

Definition of times of computation in the form of a concept of the listr8 type.

◊COEF_INST = coeff

times given are to be multiplied by a coefficient coeff given, which makes it possible to pass easily from the units SO to the natural units for a computation of wear (the month of the year).

3.12 Operand ETAT_INIT

3.12.1 Key word TABL_USURE

♦TABL_USURE =tresu   [table_sdaster]

Definition of the array which one wishes to reactualize.

Code_Aster

Version
default

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Date : 07/04/2009 Page : 14/18
Clé : U4.84.05   Révision : 475

3.12.2 Key word INST_INIT

◊INST_INIT   =tout   [R]

Definition of the time from which one wishes to reactualize the array.

3.13 Operand SECTEUR

◊SECTEUR   =

Definition of various necessary quantities to cut out the figure of clearance in angular sectors.

3.13.1 Key word COEF_USURE_MOBILE

♦COEF_USURE_MOBILE   =K_t   [R]

Definition of the coefficient of wear of the mobile within the meaning of the model of Archard for the sector.

3.13.2 Key word COEF_USURE_OBST

♦COEF_USURE_OBST =K_o   [R]

Definition of the coefficient of wear of the obstacle within the meaning of the model of Archard for the sector.

3.13.3 Key word CONTACT

♦   CONTACT   = ' type'   [kN]

Definition of the geometry of the contact for the sector considered.

3.13.4 Key word ANGL_INIT

◊   ANGL_INIT   =ang_i   [R]

Definition of the initial angular value of the sector.

3.13.5 Key word ANGL_FIN

♦ANGL_FIN=ang_f   [R]

Definition of the final angular value of the sector.

3.14 Operands TITER/INFO

◊TITER = "montitre"

Title which one wants to give to result [U4.03.01].

◊INFO   =/1
            /2

Level of printing

1   step of printing.
2   printing volumes and depths of wear at specified times

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Code_Aster

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Version
default

Date : 07/04/2009 Page : 15/18
Clé : U4.84.05   Révision : 475

3.15   produced Array

command POST_USURE generates a concept of the type counts, whose contents are:

INST: times to which the user wishes to know the volume and the depth of wear,

V_usur_tube: volume used on the level of the tube (for each time specified by the user),

V_usur_obst: volume used on the level of the obstacle (for each time specified by the user),

P_usur_tube: depth of wear on the level of the tube (for each time specified by the user).

Command IMPR_TABLE [U4.91.03] makes it possible to print the results.

Operator MODI_OBSTACLE [U4.44.22] uses a data structure of the obstacle_sdaster type to take into account the evolution of the shapes of the parts in contact because of wear.

3.16   Loading of a new tube

For the processing of the wear of the control rods, the user has the possibility of taking into account the change of a tube by a new tube by informing the key word TUBE_NEUF = "OUI'

If the user informs this key word, the operator modifies the values of wear of tube (V_USUR_TUBE, P_USUR_TUBE, V_USUR_TUBE_SECT, P_USUR_TUBE_SECT, V_USUR_TUBE_CUMU = 0) in the array resulting from POST_USURE.

After restoring of certain values, the user must call on MODI_OBSTACLE [U4.44.22] to recompute the new figures of clearance.

Code_Aster

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Version
default

Date : 07/04/2009 Page : 16/18
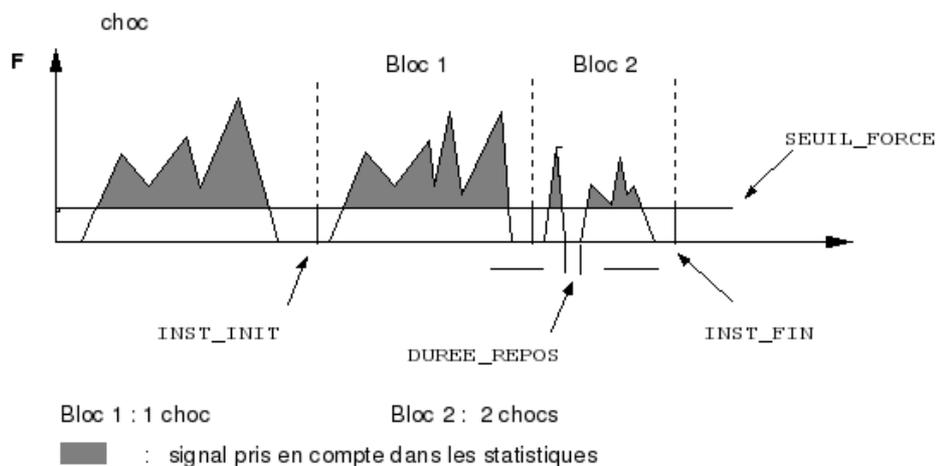*Clé : U4.84.05   Révision : 475*

4 Checking - Execution

4.1 Operand MATER_USURE

One checks that the couple of materials provided by the user is in data base.

4.2 Operands RESU_GENE / INST_INIT / INST_FIN / NB_BLOC

the value of INST_FIN is compared with final moment t_f result tran_gene. The value of INST_FIN retained is $min(t_f, t_1)$.

If the value of INST_INIT t_0 is higher than the value of INST_FIN, one stops in error.

Warning : The translation process used on this website is a "Machine Translation". It may be imprecise and inaccurate in whole or in part and is provided as a convenience.

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Code_Aster

Titre : Opérateur POST_USURE
Responsable : Nicolas BRIE

Version default

Date : 07/04/2009 Page : 17/18
Clé : U4.84.05   Révision : 475

5   Dateu

```
example = DEFI_LIST_REEL (debut = 0.25,
                  INTERVALLE = _F (JUSQU_A =  1. , NOMBRE = 20),
                               _F (JUSQU_A =  5. , NOMBRE = 10),
                               _F (JUSQU_A = 10. , NOMBRE = 5  )
                    )
#
us1 = POST_USURE (
                  PUIS_USURE   = 0.312,
                  LOI_USURE    = "ARCHARD",
                  NB_BLOC      = 4,
                  MOBILE       = _F (COEF_USURE = 30.e-15  ),
                  OBSTACLE     = _F (COEF_USURE = 20.e-15),
                  CONTACT      = "GRAPPE_1_ENCO",
                  RAYON_MOBILE = 0.00485,
                  RAYON_OBST   = 0.00545,
                  LIST_INST    = dateu,
                  COEF_INST    = 31557600. ,
                  TITER        = "NO1 = Wear per years",
                  INFO         = 2)


#
us2 = POST_USURE (
                  RESU_GENE    = dynamoda,
                  NOEUD        = "NO1",
                  LOI_USURE    = "EDF_MZ",
                  MOBILE = _F (
                          COEF_USURE = 1.e-13,
                          COEF_B     = 1.2,
                          COEF_N     = 2.44e-08,
                          COEF_S     = 1.14e-16,
                      ),
                  OBSTACLE = _F (
                          COEF_USURE = 1.e-13,
                          COEF_B     = 1.2,
                          COEF_N     = 2.44e-08,
                          COEF_S     = 1.14e-16
                      ),
                  USURE_OBST   = "OUI',
                  CONTACT      = "GRAPPE_1_ENCO",
                  RAYON_MOBILE = 0.00485,
                  RAYON_OBST   = 0.00545,
                  LIST_INST    = dateu,
                  COEF_INST    = 31557600. ,
                  TITER        = "NO1 = Wear per year",
                  INFO         = 2)
```

Code_Aster

Version default

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Date : 07/04/2009 Page : 18/18
Clé : U4.84.05   Révision : 475

6   Bibliography

1) ARCHARD J.F. : "Contact and Rubbing of flat surfaces" - Newspaper of Applied Physics, vol.24, p. 24,1953

2) P.J. HOFFMANN, D.A. STEININGER, T. SCHETTLER: "PWR Steam Generator Tubes Fretting and Fatigue Wear Phenomena and correlations". HTD - vol. 230/NE - vol. 9, Symposium one Flow-Indiced Vibration and Noise, volume 1, ASME, 1992

3) F. GUEROUT: "Wear of the tubes of Steam generators: "Geometrical Relations between worn volumes and depths" - HT.22/93-21A. EDF-DER. July 1993

4) F. GUEROUT, Mr. ZBINDEN: "Bibliographical Study of the wear models. Review of the coefficients of wear available for the study of the damage of the tubes of Steam generators" - HT.22/93-56A. EDF-DER. November 1993

5) HARROWING D.: "Operators of computations of wear" [R7.04.10]