Operator IMPR_OAR

1 Goal

To write to the result of a mechanical calculation ASTER with the format “database OAR”.

This procedure writes with the XML format (in conformity with DTD OAR) the relative information with:

- a component,
- a model finite element (MEF),
- a piping.

The treatment of the MEF, although envisaged, is not established yet.

OAR (Fast Tool for Analysis) is a computer system making it possible to carry out in a fast and sure way mechanical analyses of harmfulness of indications in the controlled areas in exploitation of the important materials for safety and/or the availability, by treating the aspects starting, propagation and stability.

2 Syntax

```
IMPR_OAR (
      # Choice of the type of result
       ♦  / TYPE_CALC =  'COMPONENT'
          ♦  DIAMETER  =  diam                                    [R]
          ♦  ORIGIN =  /  'INTERN'                              [DEFECT]
                       /  'EXTERNAL'
          ◊  COEFF_U   =  /  1.0                                  [DEFECT]
                       /  Coeff                                   [R]
          ♦  ANGLE_C   =  /  0.0                                  [DEFECT]
                       /  Psi                                     [R]
          ◊  COVERS    =  /'NOT'                                  [DEFECT]
                       /'YES'
          ◊  /RESU_MECA   =  _F (
                     ♦  NRUM_CHAR =  num_char                     [I]
                     ♦  TYPE   =  /'FX'
                                  /'FY'
                                  /'FZ'
                                  /'MX'
                                  /'MY'
                                  /'MZ'
                                  /'PRE'
                        ♦  TABLE  =  tab1                         [table]
                    # If COVERS = 'YES'
                        ◊  TABLE_S   =  tab2                      [table]
                        ),

          ◊  /RESU_THER   =  _F (
                     ♦  NUM_TRAN     =  num_tran                  [I]
                     ♦  TABLE_T      =  tabt1                     [table]
                     ♦  TABLE_TEMP   =  tabt2                     [table]
                    # If COVERS = 'YES'
                        ◊  TABLE_S   =  tabt3                     [table]
                        ◊  TABLE_ST  =  tabt4                     [table]
                        ),



       ♦  /  TYPE_CALC =  'MEF'
          ♦  DIAMETER  =  diam                                    [R]
          ♦  ORIGIN =  /  INTERN                                [DEFECT]
                       /  EXTERNAL

          ◊  COEFF_U   =  /  1.0                                  [DEFECT]
                       /  Coeff                                   [R]
          ◊  RESU_MECA =  _F (
                     ♦  AZI       =  azimuth                        [l_R]
                     ♦  TABLE_T   =  tab1                         [table]
                     ♦  TABLE_F   =  tab2                         [table]
                     ♦  TABLE_P   =  tab3
   [Twhitebait]
                     ♦  TABLE_CA  =  tab4                         [table]
                        ),

          ◊  RESU_THER =  _F (
```

```
                    ♦  AZI       =  azimuth                    [l_R]
                    ♦  NUM_CHAR  =  num_char                   [I]
                    ♦  TABLE_T   =  tabt1                      [table]
                    ♦  TABLE_TI  =  tabt2                      [table]
                    ),

    ♦  /  TYPE_CALC =  'PIPING'
       ♦  RESU_MECA =  _F (
                    ♦  NUM_CHAR  =  num_char                   [I]
                    ♦  TABLE  =  tabl                          [table]
                    ♦  GRID = my                             [grid]
                    ),

    ◊  UNIT   =  /  38                                         [DEFECT]
                 /  unit                                       [I]
    ◊  ADDITION  =  /  'NOT'
[DEFECT]
                 /  'YES'
```

3 Operands

3.1 Operand TYPE_CALC

♦ / TYPE_CALC = 'COMPONENT'

Construction of a XML tree structure according to the component DTD

/ TYPE_CALC = 'MEF'

Construction of a XML tree structure according to DTD MEF

/ TYPE_CALC = 'PIPING'

Construction of a XML tree structure according to the DTD piping

3.2 Operand if TYPE_CALC = 'COMPOSANT'

♦ GRID = e-mail

Name of the concept grid of the type grid.

3.2.1 Keyword DIAMETER

♦ DIAMETER = diam

Diameter of the component.

3.2.2 Keyword ORIGIN

♦ ORIGIN =/ 'INTERN'
/ 'EXTERNAL'

Indication of the position of the origin of the line of cut. By default the value is: 'INTERN'

3.2.3 Operand COEFF_U

◊ COEF_U = coeff

Multiplying coefficient for the unit of length (value by default 1.0).

3.2.4 Operand ANGLE_C

♦ ANGLE_C = psi

Angle of the line of cut compared to the wall expressed in degrees (value by default 0.0).

3.2.5 Operand COVERS

◊ COVERS = 'NOT'
/ 'YES'

Indicate the presence of a coating on the structure (value by default 'NOT').

3.2.6 Keyword RESU_MECA

3.2.6.1 Operand NUM_CHAR

♦ NUM_CHAR = numchar

Number of the loading.

3.2.6.2 Operand TYPE

♦ TYPE = / 'FX'
/ 'FY'
/ 'FZ'
/ 'MX'
/ 'MY'
/ 'MZ'

Type of loading.

3.2.6.3 Operand TABLE

♦ TABLE = table

Table of the constraints for the structure.

3.2.6.4 Operand TABLE_S

◊ TABLE_S = table_s

Table of the constraints in the coating (if REVET=' OUI').

3.2.7 Keyword RESU_THER

3.2.7.1 Operand NUM_TRAN

♦ NUM_TRAN = num

Number of the thermal transient.

3.2.7.2 Operand TABLE_T

♦ TABLE_T = table_t

Table of the thermomechanical constraints per moment.

3.2.7.3 Operand TABLE_TEMP

♦ TABLE_TEMP = table_temp

Table of the temperatures.

3.2.7.4 Operand TABLE_S

◊ TABLE_S = table_s

Table of the thermomechanical constraints in the coating (if REVET=' OUI').

3.2.7.5 Operand TABLE_ST

◊ TABLE_ST = table_st

Table of the temperatures in the coating (if coating).

3.3 Operand TYPE_CALC = 'MEF'

This keyword is not treated in the current version of IMPR_OAR . The use of this keyword leads to one alarm indicating that this function is not established.
Syntax associated with the keyword is not checked.

3.4 Operand TYPE_CALC = 'TUYAUTERIE'

3.4.1 Keyword RESU_MECA

3.4.1.1 Operand NUM_CHAR

♦ NUM_CHAR = numchar

Number of the loading.

3.4.1.2 Operand TABLE

♦ TABLE = table

Table of the constraints for the structure.

3.4.1.3 Operand GRID

♦ GRID = e-mail

Grid used for calculation.

3.5 Operand UNIT

◊ UNIT = unit

Logical number of unit of the output file (value by default 38).

3.6 Operand ADDITION

◊ ADDITION = /'YES'
/'NOT'

Indicate that the writing must be done following the file defined by UNIT. By default, the value is 'NOT'.

4 Example of use

4.1 COMPONENT

With resulting from calculation the user produces the tables necessary to the generation of file OAR using the macro one MACR_LIGN_COUPE). The macro one MACR_LIGN_COUPE must be called as many times as necessary to obtain the tables used by IMPR_OAR :

1) A cut for a mechanical result on a component without coating,
2) Two cuts for a mechanical result on a component with coating.
3) Two cuts (one on the thermomechanical results, for the thermal results) for a thermomechanical result on a component without coating.
4) Four cuts (two thermomechanical results – structure and coating and two thermal results – idem) for a thermomechanical result for a component with coating.

```
# 1. Cut of the coating
#  1.1 Mechanics
T_MEC2_R=MACR_LIGN_COUPE (RESULTAT=RESUT,
                          NOM_CHAM=' SIEF_NOEU',
                          MODELE=MADMECA,
                          LIGN_COUPE=_F (NB_POINTS=3,
                                         COOR_ORIG= (0.18, 0.1, 0.0,),
                                         COOR_EXTR= (0,185, 0.1, 0.0,),),);

#  1.2 Thermics
T_THE2_R = MACR_LIGN_COUPE (RESULTAT=TEMPE,
                            NOM_CHAM=' TEMP',
                            MODELE=MODETH,
                            LIGN_COUPE=_F (NB_POINTS=3,
                                           COOR_ORIG= (0.18, 0.1, 0.0,),
                                           COOR_EXTR= (0,185, 0.1, 0.0,),),);

# 2. Cut of the structure
#  2.1 Mechanics
T_MEC2_S=MACR_LIGN_COUPE (RESULTAT=RESUT,
                  NOM_CHAM=' SIEF_NOEU',
                  MODELE=MADMECA,
                  LIGN_COUPE=_F (NB_POINTS=9,
                                 COOR_ORIG= (0,185, 0.1, 0.0,),
                                 COOR_EXTR= (0,200, 0.1, 0.0,),),);

#  2.2 Thermics
T_THE2_S = MACR_LIGN_COUPE (RESULTAT=TEMPE,
                            NOM_CHAM=' TEMP',
                            MODELE=MODETH,
                            LIGN_COUPE=_F (NB_POINTS=9,
                                           COOR_ORIG= (0,185, 0.1, 0.0,),
                                           COOR_EXTR= (0,200, 0.1, 0.0,),),);


IMPR_OAR (TYPE_CALC = 'COMPONENT',
          DIAMETRE=0.2,
          RESU_THER=_F (NUM_TRAN=1,
                        TABLE_T=T_MEC2_S,
                        TABLE_TEMP=T_THE2_S,
                        TABLE_S=T_MEC2_R,
                        TABLE_ST=T_THE2_R,),
           AJOUT=' OUI');
```

NB: It is important to note that in the presence of a coating, the cut of the structure and the cut of the coating must share a common point. The absence of point of this common point produces an error.

4.2 PIPING

With resulting from calculation the user produces the tables necessary to the generation of file OAR using the macro POST_RELEVE_T).

```
tab24 = POST_RELEVE_T (ACTION = _F (
                                    ENTITLE = 'test',
                                    NODE = ('N1'  , 'N5'  , 'N10', 'N15,
'N20',  'N25',  'N30',  'N35',  'N40',  'N45',  'N50',  'N55',  'N60',  'N65',
'N70',  'N75',  'N80',  'N85',  'N90',  'N95',  'N100',  'N105',  'N110',  'N115',
'N120',  'N125',  'N130',  'N135',  'N140',  'N145',  'N150',  'N155',  'N160',
'N165',  'N170',  'N175',  'N180',  'N185',  'N190',  'N195',  'N200',  'N205',
'N210',  'N215',  'N220',  'N225',  'N230',  'N235',  'N240',  'N245',  'N250',
'N255',  'N260',  'N265',  'N270',  'N275',  'N280',  'N285',  'N290',  'N295',
'N300',  'N305',  'N310',  'N312',  'N315',  'N320',  'N325',  'N330',  'N335',
'N340', 'N345', 'N350', 'N355', 'N360',),
                                    GROUP_MA = 'LINE',
                                    RESULT = RESU24,
                                    NOM_CHAM = 'EFGE_ELNO',
                                    TOUT_ORDRE = 'YES',
                                    TOUT_CMP=' OUI',
                                    OPERATION=' EXTRACTION',),);

IMPR_OAR (TYPE_CALC = 'PIPING',
         RESU_MECA=_F (NUM_CHAR=1,
                       TABLE=tab24,
                       MAILLAGE=MA,),);
```