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'
     / '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 [1_R]
      ♦ TABLE_T = tab1 [table]
      ♦ TABLE_F = tab2 [table]
      ♦ TABLE_P = tab3 [table]
      [Twhitebait]
      ♦ TABLE_CA = tab4 [table]
   ),

   ◊ RESU_THER = _F (  

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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]
ADDITION = / 'NOT' [DEFECT]

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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').

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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 if 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 if 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');
```

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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).

```plaintext
tab24 = POST_RELEVE_T (ACTION = _F (ENTITLE = 'test', NODE = ('N1', 'N5', 'N10', 'N15',
'S20', 'N25', 'N30', 'N35', 'N40', 'N45', 'N50', 'N55', 'N60', 'N65',
'S70', 'N75', 'N80', 'N85', 'N90', 'N95', 'N100', 'N105', 'N110', 'N115',
'S120', 'N125', 'N130', 'N135', 'N140', 'N145', 'N150', 'N155', 'N160',
'S165', 'N170', 'N175', 'N180', 'N185', 'N190', 'N195', 'N200', 'N205',
'S210', 'N215', 'N220', 'N225', 'N230', 'N235', 'N240', 'N245', 'N250',
'S255', 'N260', 'N265', 'N270', 'N275', 'N280', 'N285', 'N290', 'N295',
'S300', 'N305', 'N310', 'N312', 'N315', 'N320', 'N325', 'N330', 'N335',
'S340', '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)),

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