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RAS Modeling Findings

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Agenda



1. RAS Implementation in PSLF
2. RAS Implementation in TARA
3. Fields in Question
4. Available Documentation
5. Results
6. Conclusions & Resolutions

RAS Implementation in PSLF

- Testing RAS in PSLF to ensure proper execution
- .wcrf file
 - **MODELCONDITION** (Name, Object, FilterObjectType, FilterLogic, EvaluateInRef, DisableIfTrueInRef, Memo)
 - **MODELCONDITIONCONDITION** (ModelCondition, CondNum, ObjectField, ConditionType, Value, OtherValue, Absolute, TimeDelay, ObjectFieldEvalRef)
 - **MODELFILTER** (Name, Logic, Memo)
 - **MODELFILTERCONDITION** (Modelfilter, CondNum, Criteria, Logic, TimeDelay)
 - **MODELEXPRESSION** (Name, Type, Expression, Memo, Object1, x1, blankzero1, evalinref1, Object2, x2, blankzero2, evalinref2,)
 - **REMEDIALACTION** (Name, Skip, Memo)
 - **REMEDIALACTIONELEMENT** (RemedialAction, Object, Action, Criteria, CriteriaStatus, Comment, TimeDelay, InclusionFilter, Persistent, CommunicationTimeDelay)

RAS Implementation in TARA

- Testing accuracy of TARA software to check with results of RAS testing in PSLF
- Used same .wcrf file – only difference is the extension used in TARA, .aux

WarnID	#Warn	Sever	Message
1001	2	2-error !	Keyword not found in the dictionary
1690	658	2-error !	Input template format Error. Unknown Type of SPS Model Condition Data

WarnID - 1001

WarnInd	WarnID	SeverLvl	Message
433	1001	2	Keyword [TimeDelay] not found in the INCH dictionary for [MODELCONDITIONCONDITION]
504	1001	2	Keyword [CommunicationTimeDelay] not found in the INCH dictionary for [REMEDIALACTIONELEMENT]

WarnID - 1690

WarnInd	WarnID	SeverLvl	Message
434	1690	2	Input template format Error. Unknown Type of SPS Model Condition Data [0 []]
435	1690	2	Input template format Error. Unknown Type of SPS Model Condition Data [0 []]
436	1690	2	Input template format Error. Unknown Type of SPS Model Condition Data [0 []]
437	1690	2	Input template format Error. Unknown Type of SPS Model Condition Data [0 []]
438	1690	2	Input template format Error. Unknown Type of SPS Model Condition Data [0 []]
439	1690	2	Input template format Error. Unknown Type of SPS Model Condition Data [0 []]

Fields in Question

- WARN ID – 1001 (2 errors)
 - **MODELCONDITIONCONDITION** (ModelCondition, CondNum, ObjectField, ConditionType, Value, OtherValue, Absolute, TimeDelay, ObjectFieldEvalRef)
 - **REMEDIALACTIONELEMENT** (RemedialAction, Object, Action, Criteria, CriteriaStatus, Comment, TimeDelay, InclusionFilter, Persistent, CommunicationTimeDelay)
- WARN ID – 1690 (658 errors)
 - Number of elements in the two fields combined
 - Issue: Unknown keywords

PowerWorld Documentation

- Very similar to PSLF RAS Quick Start guide

```
ModelConditionCondition (ModelCondition, CondNum, ObjectField, ConditionType,  
                        Value, OtherValue, Absolute)
```

```
{  
"2-11 Line (Open)"      "1" "DerivedOnline" "=" "Closed" "" "NO"  
"3-44 Line (Open)"     "2" "DerivedOnline" "=" "Closed" "" "NO"  
"Interface Bobby High" "3" "MW"          ">" 500      "" "NO"  
"Interface Bobby High" "4" "Mvar"        ">" 100      "" "NO"  
"Bus Jackie Low"       "5" "V"            "<" 0.95     "" "NO"  
"Sample Field and Exp" "6" "MW"          ">" "MWMax" "" "NO"  
"Sample Field and Exp" "7" "Mvar"        ">" "Expression 'Mvar Lim'" "" "NO"  
}
```

```
RemedialActionElement (RemedialAction, Object, Action, Criteria,  
                      CriteriaStatus, TimeDelay, InclusionFilter, Comment)
```

```
{  
"Cowboy RAS"      "GEN 31 1" "OPEN" "OPEN Cowboy G1"      "TOPOLOGYCHECK" 0 "" ""  
"Viking RAS"     "INJECTIONGROUP 'Viking G1 and G2'" "OPEN" "OPEN Viking G1 and G2"  
                "TOPOLOGYCHECK" 0 "" ""  
"Dolphin-Raider RAS" "GEN 28 1" "OPEN" "Dolphin-Raider 1 138 kV Line"  
                "TOPOLOGYCHECK" 0 "" ""  
"Viking-Dolphin 1 Overload" "BRANCH 28 29 1" "OPEN" "Viking-Dolphin 1 345/138 Over 135%"  
                "POSTCHECK" 0 "" ""  
"Viking-Dolphin 2 Overload" "BRANCH 28 29 2" "OPEN" "Viking-Dolphin 2 345/138 Over 135%"  
                "POSTCHECK" 0 "" ""  
}
```

Results

PSLF

- **MODELCONDITIONCONDITION**
(ModelCondition, CondNum, ObjectField, ConditionType, Value, OtherValue, Absolute, **TimeDelay, ObjectFieldEvalRef**)
- **REMEDIALACTIONELEMENT**
(RemedialAction, Object, Action, Criteria, CriteriaStatus, Comment, TimeDelay, InclusionFilter, **Persistent, CommunicationTimeDelay**)

TARA

- **MODELCONDITIONCONDITION**
(ModelCondition, CondNum, ObjectField, ConditionType, Value, OtherValue, Absolute)
- **REMEDIALACTIONELEMENT**
(RemedialAction, Object, Action, Criteria, CriteriaStatus, Comment, TimeDelay, InclusionFilter)

Each RAS was triggered as expected in both software once appropriate changes were made.

Conclusions & Resolutions

- PSLF RAS file adds optional fields (TimeDelay, ObjectFieldEvalRef in MODELCONDITIONCONDITION and Persistent, CommunicationTimeDelay in RemedialActionElement) with no errors
- TARA shows errors when optional fields are included in RAS file
 - Once optional fields excluded in RAS file, TARA compiles with no errors
- Ask MVS if the present RAS changes in PSLF need to be included in RAS specification and implemented by other software vendors.
- Update the documentation to include the optional fields are not recognized in TARA


Thank you!

Questions?

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