

Subject: .ANDTHEN. and .ORELSE. operators
 From: Van Snyder
 Reference: 03-258r1, section 2.8.2

1 Number

2 TBD

3 Title

4 .ANDTHEN. and .ORELSE. operators.

5 Submitted By

6 J3

7 Status

8 For consideration.

9 Basic Functionality

10 Provide logical AND and OR operators that force short-circuit evaluation, rather than merely allowing
 11 it.

12 Rationale

13 The standard presently allows a processor to short-circuit evaluation of logical expressions. For example,
 14 in A .AND. B, the processor is allowed not to evaluate B if A is false. It is sometimes desirable, however,
 15 to *require* that the processor not evaluate B if A is false, as opposed simply to *allowing* it not to. Here's
 16 an example:

```
17   if ( present(x) .and. x /= 0 ) ...
```

18 One can't *depend* on the processor not trying to evaluate `x /= 0` if `x` is not present.

19 To support this desire, add an .ANDTHEN. operator, the semantics of which require the processor to
 20 evaluate the first operand first, and then prohibit it from evaluating the second operand if the first is
 21 false. The example becomes:

```
22   if ( present(x) .andthen. x /= 0 ) ...
```

23 Similar considerations apply to the .OR. operator, leading to the desire for an .ORELSE. operator, in
 24 which the second operand is prohibited to be evaluated if the first is true.

25 These operators are, of course, even more useful elementally in WHERE statements and constructs. For
 26 example

```
27   where ( x > 0.0 .andthen. log(x) < tol ) ...
```

28 Estimated Impact

29 Minor.

30 Detailed Specification

31 Provide logical AND and OR operators that force short-circuit evaluation, rather than merely allowing
 32 it. One possible spelling is .ANDTHEN. and .ORELSE.

33 History