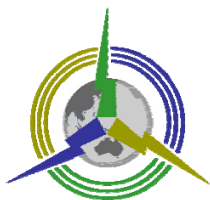


IEC TC 57 WG 10

**Enhanced Engineering Process SCL Files
Proposal for SFD File and Hierarchical Logical Nodes
Example Discussion**



Rod Hughes Consulting Pty Ltd

A.B.N. 64 137 442 089

PO Box 757

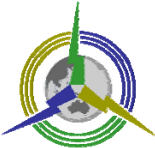
Blackwood

SA 5051

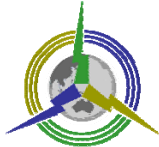
Australia

www.rodhughesconsulting.com

**Enhanced Engineering Process SCL Files
Proposal for SFD File and Hierarchical Logical Nodes**

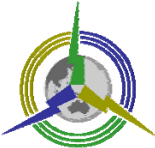


This document has been prepared by:



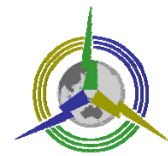
Rod Hughes Consulting Pty Ltd
PO Box 757
Blackwood
SA 5051
Australia

Issue	Date	Filename	Comment
1-0	6 Oct 2012 7:51 AM	SFD Example.docx	



Contents

1. EXAMPLE SCENARIO 4



1. EXAMPLE SCENARIO

The following is atypical example in support of the proposal for a new file type "SFD"

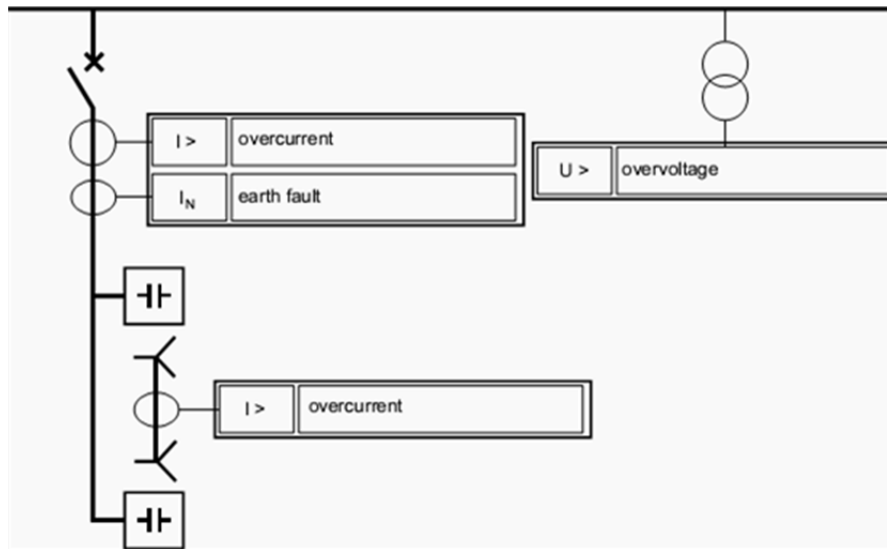


Figure 1 Reference Drawing

"Behind" the top CT is a whole bunch of information such as star connection, CT ratio, class etc – that might be listed over in a table somewhere on the drawing "CT1: 500/1 30VA 10P20"

"Behind" the O/C relay is a whole bunch of info in a spec probably as 3ph O/C, 2 x Very Inverse + 1 x extremely inverse, pick_up_stage1I> = 500A, , pick_up_stage2I>> = 900A

Also "behind" that is some words somewhere that it has CBF send and receive, no A/R and has harmonic measurement and pos/neg sequence protection and we want to read A into the SCADA with disturbance recording on all phases

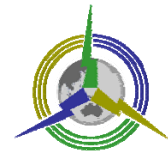
...and is configured with Rev Blocking to the upstream incomer to the bus (Ok – I know I haven't worked out how to include that in an SFD other than a text field but perhaps Marco's VSM is at least part of the clue)

"Behind" the cap bank star point CT is a whole bunch of information such as CT ratio, class etc – that might be listed over in a table somewhere on the drawing "CT3: 50/1 5VA 10P20"

"Behind" the cap bank star point O/C is that it is a 1ph O/C, 1 stage Def time pick up 10A with harmonic filtering

The SFD must capture all that 'generic' info in **single** instances of TCTR and PTOC, RBRF, MHAR, MSQI, MMXU

Enhanced Engineering Process SCL Files Proposal for SFD File and Hierarchical Logical Nodes



Eg TCTR would need additional DO fields:

Core.		Number of CT cores represented 1/3/4		
CoreDiam		Diameter of central hole in mm		
CTType		Wound/Optical/Rogowski		
CTGroup		Star/Delta (Star if Core = 1)		
CTGrpRat		Overall current ratio of the group if CTGrp=star GrpRat=.Rat = WindRat, if CTGrp = Delta, GrpRat = Rat but $0.5777 \times \text{GrpRat} = \text{WindRat}$		
CTWindRat		Winding ratio of individual CT core (as would appear on individual CT core name plate)		
CTClassVA		IEC 60044 eg 30 for a 30VA 10P20		
CTClassAcc		IEC 60044 eg 10 for a 30VA 10P20		
CTClassALF		IEC 60044 eg 20 for a 30VA 10P20		

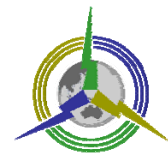
Later when the System Specifier and/or System Integrator starts to develop the SSD and SCD, the SFD can indicate in a single LN instance how many multiple instances of TCTR and PTOC per phase/stage are required.

These individual instances in the SFD need to be able to pass on their specification information easily a) to the engineer (or a smart tool) to know how many instances are required and to b) pass on the various values of the DO but always maintaining the link to that original value prescribed in the SFD.

You will note to that things like the TCTR1 now has all the specification for procurement of the CTs so that information can be used by the contractor directly to order CTs

All that is necessary now is to identify the difference between these top level instances of the LN in the SFD and the same instance being retained in the SCD along with its actual individual instances.

The following table shows the differences of focus and content between the SFD and the SCD file noting that the TCTR1 instance has flowed through into the SCD:



SFD	SCD			
	PD=MicomP140			
TCTR1	TCTR1	TCTR2	TCTR3	TCTR4
LNType=Grouped	LNType=Grouped	LNType=Individual	LNType=Individual	LNType=Individual
GrRef=nul	GrRef=nul	GrRef=TCTR1	GrRef=TCTR1	GrRef=TCTR1
Core=3	Core=3	Not necessary but could be shown		
CoreDiam=100	CoreDiam=100	Not necessary but could be shown		
CTType=Wound	CTType=Wound	Not necessary but could be shown		
CTGroup=Delta	CTGroup=Delta	Not necessary but could be shown		
CTGrpRat=500	CTGrpRat=500	Not necessary but could be shown		
CTWindRat=288.5	CTWindRat=288.5	Not necessary but could be shown		
CTClassVA=30	CTClassVA=30	Not necessary but could be shown		
CTClassAcc=10	CTClassAcc=10	Not necessary but could be shown		
CTClassALF=20	CTClassALF=20	Not necessary but could be shown		
Rat=500	Rat=500	Rat=500	Rat=500	Rat=500

Note1: it must be specified that if any tool is being used with the SCD, it must maintain the inheritance between TCTR1.Rat and TCTR2.Rat, TCTR3.Rat and TCTR4.Rat according to their GrRef. If any tool/IED detects inconsistency between them (manual editing of one instance but not the others), alarm is raised.

Note2: if CTType was Optical/Rogowski, then some of these bits of info are not relevant – there may be other fields relevant to those so a bit of thinking to expand potential fields for primary plant related things

Note3: also I see the engineering tools as being able to handle these “I>” type symbols or device 50, device 51, device 50/51 when they draw these diagrams and link them to their correct LNs as per the Standard – this is important for the conversion of existing SLD (Schneider's scanning feature?) to IEC 61850 SLD objects, but this is a tool issue, not for the Standard or the WG.