



SWAT SC Working Group Meeting Thursday, January 25, 2007

Location: Trico Electric Cooperative, Meeting Room

Time: 9:30AM-3:45 PM

Notes: Tom Field, WAPA
A copy of the agenda, a list of attendees, and the distributed material is attached to the end of these notes.

1) Introductions, Approval of Previous Meeting Minutes, and Update on Action Items

Tom Field opened the meeting by stating that there were several things that he wanted to cover in this meeting. Tom stated that he had an item on the agenda for combining cases and that he wanted to start on the case combination at this meeting to meet the July deadline for having a completed case. The agenda was distributed and is attached to the end of these minutes. The items on the agenda were each read.

There were 4 participants at the meeting and 3 participants on the teleconference. The list of members on the website was shown and the sign in sheet was passed around. Tom F. asked everyone if they would object to placing their contact information on the sign in sheet on the website in the meeting minutes. There were no objections. Everyone was asked to introduce themselves. The list of participants is attached to the end of these minutes.

The link to the previous meeting minutes on the website was shown next. The previous meeting minutes were shown on the screen. Tom asked everyone to review the meeting minutes as he slowly scrolled through them. Tom F. asked if anyone saw anything in the previous meeting minutes that they wanted changed or if there was anything they wanted added. Tom F. pointed out that Don A. was to make a map, but it was not listed as an action item in the minutes. Everyone agreed to list this under the map section in this meeting as an action item and not amend the previous minutes. There were no changes requested. Tom asked everyone if they agreed that the previous meeting minutes should be listed as approved. Everyone agreed. As an action item, Tom F. stated that he would show the October 2006 minutes on the website as approved.

a) Action Items

The action items from the previous meeting were covered next.

The first action item was for Tom Field to place the September meeting minutes on the website as approved. Tom stated this had been done.

The next action item was for Tom Field to investigate the latest change made by Aspen which is supposed to take care of the transformer problems in the PTI to Aspen conversion. Tom stated that he had not had time to do this due to priorities on other projects. This is still an open action item.

The next action item was for Tom Field to rerun the DPV2 case and check to verify that the charging was not set to zero originally since the screen shot showed the "set charging to zero" as checked for the new Aspen transformer option comparison of PTI to Aspen. Tom stated that he had not had time to do this since the last meeting. This is still an open action item.

The next action item was for Mike Agudo ask Lane C. of WAPA if he went to the October 16, 2006 Western Protective Relay Conference and if he did, he would ask him if he would provide a report to the group. Tom stated that Mike had informed him that Lane did not attend the conference this year.

The next action item was for Maria Ramirez to find out who at SRP attended the Western Protective Relay Conference and ask them if they would give a report to the group on the meeting. Tom stated that Maria was not at the meeting and had not updated him on this. This is still an open action item.

The next action item was for Tom Field to place a link to the Western Protective Relay Conference on the SWAT SCWG website. Tom stated this had been done and showed the link.

The next action item was for Tom Field to compile the SWTC reclosing questionnaire responses and post them in an encrypted file on the website. Tom F. stated that Tom Spence had started a working group on reclosing after the last meeting. Tom F. stated that the responses that had been received were on the website, but not everyone sent in a response. Tom F. asked Tom S. if this should still be an open action item. Tom S. stated that they would still be useful if he could get them. He stated that he had some follow up questions on the responses received. He stated that he would like to have the rest of the responses sent in. This is still an open action item.

The next action item was for Tom Spence to provide the reclosing working group information to Tom F. to put on the website. Tom stated that the last working group meeting was on January 24. He stated that he had put the responses that the SWAT SCWG sent in into a spreadsheet. He said he also had information from the meeting. He stated that they would have another meeting in a couple of weeks. He stated that he would like to finish a lot of things that are lined up to be done and then provide the information to the SWAT SCWG. He stated that he may be able to do this by the next meeting. This is still an open action item.

The next action item was for Kevin Salsbury to contact Alex F. and obtain the date for the next EN-SCSG meeting. Kevin stated that he had talked to Alex and Alex informed him that the next meeting would be delayed due to his workload. He stated that the next meeting may be scheduled by the end of March. He stated that Alex would contact Tom F. before the next meeting date and provide the information to share with those in the SWAT SCWG that would like to attend. As an action item, Tom Field will send the EN-SCSG information on the next meeting to all of the SWAT SCWG members.

The next action item was for Kevin Salsbury to send the address of the EN-SCSG webpage to Tom F. to place on the SWAT SCWG webpage. Kevin stated that the webpage had not been setup yet. This is still an open action item.

The next action item was for Tom Field to put the EN-SCSG webpage link on the SWAT SCWG webpage. Tom stated this could not be done until the EN-SCSG webpage is setup. This is still an open action item.

The next action item was for Tom Field to contact Alex F. and ask him to chair the EN-SCSG task force. Tom stated that he had contacted Alex and showed an email response from Alex dated November 3, 2006. Alex suggested that Tom F. chair the task force in his email. Tom stated that this would be discussed further in the EN-SCSG agenda item.

The next action item was for Tom Field to talk to TEP about TEP/Unisource being a member of the EN-SCSG. Tom S. of SWTC did not state whether or not SWTC wanted to be a member of the EN-SCSG in the previous meeting. Tom F. stated that he had not contacted TEP about this yet. Tom F. stated that this would be discussed further during the EN-SCSG agenda item along with the need for a response from SWTC. This is still an open action item.

The next action item was for Tom Field to arrange a teleconference with SCE, SDGE, CFE, IID, and SWAT for the Southern California short circuit case. Tom stated this had been done. Tom stated that he sent out an email before the teleconference to the participants with background information on the need for building the case. This email was shown. Tom stated that this email went through the history of what had been done to try and develop a short circuit case with Southern California since the SWAT SCWG began which included the desire to obtain a reciprocity agreement with them for sharing of the case between the two groups similar to the verbal agreement with the CCPG Short Circuit Database Working Group.

Tom stated that the first teleconference was held on November 8 with SDG&E, SCE, CFE, IID, SPPC, and WAPA on November 8, 2006. Tom showed an email that was sent after the teleconference with a summary of what was said. Robert S. stated that Gary Chinn was leaving SCE and that he would contact his supervisor to find out who would be replacing him. He also pointed out that the last n in Chinn was not in the email.

Tom stated that CFE, SDG&E, and SCE each agreed to share their short circuit data with each other in a combined case. Tom stated that CFE and SDG&E agreed to provide data to the 69 kV level, but SCE was not sure whether they would or if they would equivalence below 220 kV. Tom stated that CFE uses PSS/E, SDG&E uses Aspen, and SCE uses Cape.

Tom stated that they went through the benefits of having a combined case. He stated that one of the benefits was getting the correct DC offset for breakers when they are near equivalents. Tom stated that Ron had previously stated this from his findings in the Four Corners area. Tom asked Ron O. if this was a correct statement and Ron stated that it was. Tom stated that in this teleconference, he suggested that Ron O. participate in the next teleconference.

Tom stated that he went through the mechanics of combining the cases. He pointed out that the method that the SWAT SCWG was undertaking would allow the cases to be combined for future upgrades with no problems. A question was asked about what CCPG was doing. Tom stated that he did not know and had hoped that having a liaison with CCPG would provide this information. He stated that all he knew was that members of the CCPG that participated in earlier teleconferences were putting the case together and the email update by Bill M. implied that the case was not complete yet.

Tom stated that in the teleconference they agreed that the protection people from SCE and SDG&E should be involved in the next teleconference. Tom stated that the main issue was allocation of resources for putting the case together. He stated that they wanted to be able to show the benefits of doing this to justify the resources. Tom stated that a second teleconference was requested to show the benefits to SCE and SDG&E. A second teleconference was arranged for November 14 and Tom showed the email for this coordination. Tom stated that most people did not participate in the teleconference on November 14 due to a WECC meeting.

Tom stated Alex Fratkin representing SPPC/NPC was also in the teleconference because the EN-SCSG also desired to have a combined case from Southern California for their work and that this effort would be a good start in developing that case. Tom stated that because of the low participation, he tried to arrange a third teleconference, but due to holidays and workload, this teleconference did not happen.

Tom stated that the main problem appears to be resources. Ron O. stated that this is probably because the right people were not on the teleconference. Tom stated that this is similar to the situation in the beginning with SRP where Ron and Tom both met with the manager and engineers in the protection department and the planning department. Tom stated that they both saw the benefits of a combined case, but felt another group should supply the resources. Tom stated that it appears that they are now both participating because he thought that Maria was in the planning department and David was in the protection department.

Tom stated that one of the things he tried to point out was that the planning groups spent a year developing the PDV2 short circuit case and several months developing the centennial short circuit case. Tom stated that Alex had pointed out in the second teleconference that these cases are no longer useful. Tom stated that if they had a coordinated case, they would not have had to spend all that time, but the problem is convincing the planning group that this saves them time. Everyone agreed that this was a benefit.

Tom stated that the SWAT SCWG has a mix of planning and protection people in it. Tom stated that some companies use a different program for planning than protection. Ron stated that SCE uses CAPE for protection and PSS/E for planning short circuit studies.

Tom stated that with the holidays over, another meeting should be scheduled so the momentum is not lost. Robert S. stated that Gary Chinn would be leaving SCE. As an action item, Robert Sanders will contact his supervisor to see who the new contact at SCE in planning for short circuit work will be. Robert stated that the people at IID that participated had been very busy over the past few months. As an action item, Robert S. stated that he would contact Tom F. after the meeting with a time frame for the next teleconference. As an action item, Robert S. stated that he would talk to SCE about their planning people versus their protection people being involved in the effort. As an action item, Ron O. stated that he would participate in the next teleconference to provide justification for developing the case.

Tom F. stated that since the last meeting, IID protection people requested the WAPA short case equivalents. Tom stated that he had responded to the request that their case was available to IID on the website and provided the IID contacts for the case. Tom stated that he was wondering whether or not IID had made similar requests of SCE and SDG&E. Robert S. stated that he was unaware of the request. As an action item, Tom F. stated that he would send the email on the equivalents data request from IID to Robert S. after the meeting. Tom stated that this may be helpful in determining who from those companies should participate in the next teleconference. As an action item, Robert S. stated that he would see if the SCE, SDG&E, and CFE equivalents were also requested, and, if they were, find out who the people were that were contacted and have them involved in the next teleconference.

The next action item was for the entire group to send in the areas and zones they want to use for their data. Tom stated that he still only had one utility with all of their dedicated zones. This is still an open action item and will be discussed more in the agenda item on areas and zones.

The next action item was for the entire group to send in the zones they want to use for their mutual zone, their equivalent zone, and their seams zone. This is still an open action item and will be discussed more in the agenda item on areas and zones.

The next action item was for Maria Ramirez to contact Steve C. and ask him to send in the PNM case for error checking. Tom F. stated that he had received an email from Steve which indicated that he would not be able to provide the case until he finished combining the TNMP system with the PNM system. The email was shown which stated the case is being worked on. Tom asked David G. if this would be a problem since PNM is a system adjacent to his. David stated that he could not combine his case without having the PNM case. It was stated in the meeting that TNMP had been purchased by PNM. It was stated that PNM may be struggling to get data because their headquarters is in Houston. Tom F. asked if anyone knew when TNMP had been acquired by PNM so the group would have a feel for how long the delay might be. Don A. looked up the information on the internet and found that it had been acquired in June 2005. Tom pointed out that Steve was not in the meeting and the email appeared to indicate that he may not be able to make it to other meetings if the schedule was not changed to a Tuesday or Wednesday. David G. requested that the group move the meeting to Tuesday or Wednesday to get Steve involved in the process again. Tom stated that this suggestion was in the presentation in the section on the next meeting and would be discussed in more detail during the agenda item on the next meeting.

The next action item was for the entire group to send their information to Tom F. to change the buses spreadsheet if they are an owner of a seams bus and want different information than in the WECC case. Tom stated that he had included the SRP information Maria R. sent on October 25 in the buses spreadsheet. Tom stated that he had not received any other member information. Tom stated this was still an open action item and would be discussed in more detail during the agenda item on areas and zones.

The next action item was for the entire group to review their seams buses that they are the owners of in the WECC case, return any split WECC buses to Tom F., and indicate which lines are connected to them and the bus numbers they want to use for them. Tom stated that he had not received any information from any of the members yet. Tom stated this is still an open action item.

The next action item was for the entire group to start putting area and zone information in their cases in preparation for the combining of the cases. Tom stated that several members have put areas and zones in their cases. Tom stated that SRP recently asked for some clarification on equivalents and seams buses while working on their case. He showed an email with the clarification sent to SRP. Tom stated that if SRP wanted clarification, others may also have similar questions. Tom summarized the clarification in the email and asked if anyone was unclear on equivalents and seams buses. Everyone stated that it was clear. Tom stated that SRP was not able to attend, but sent an email which indicated they would soon be finished with the area and zone information in their case. Tom stated that this was still an open action item and would be discussed in more detail during the agenda item on areas and zones.

The next action item was for Tom Field to change the buses spreadsheet to include any split bus information that members send in. Tom stated that he had not received any information yet, so this is still an open action item.

The next action item was for the entire group to identify their seams buses, send a revised list from the spreadsheet with just seams buses, and indicate the names and numbers they want changed in the spreadsheet. Tom stated that SRP was the only member to send information in yet. Tom stated this is still an open action item and would be discussed in more detail during the agenda item on areas and zones.

The next action item was for the entire group to change the names and numbers of their seams buses to match the spreadsheet names and numbers for the owners of the seams buses. Tom stated that everyone needs to send in their seams bus information before others can change their cases for these. Tom stated this is still an open action item.

The next action item was for Tom Field to change the buses spreadsheet to include any changes that the members send in. Tom stated that he had updated the sheet with the information that Maria sent, but others have not sent their information in yet. Tom stated the updated spreadsheet is on the website. Tom stated this is still an open action item.

The next action item was for the entire group to add unique bus numbers to their buses that have a bus number of 0 and send in their case for the second round of error checking to be able to determine the number of buses with a difference of 100 A or more. Tom stated that most of the cases have unique bus numbers now. Tom stated that the SWRTA case doesn't. As an action item, Don Adams stated that he would send in the SWRTA case with unique bus numbers. As an action item, Tom Field stated that he would manually change the TEP case with over 400 buses having a number of 0 to unique bus numbers. Tom stated this is still an open action item.

The next action item was for Tom Field to put a branches sheet for all of the buses in the buses spreadsheet. Tom F. stated this had been done and it is on the website. Tom showed the cases section of the website and pointed to the "Buses" link next to "Area and Zone". Tom stated that this is where the updated spreadsheet can be downloaded from. Tom stated that he exported the case to EPC format in PSLF and then wrote a FORTRAN program to extract the information. Tom stated that there are now 2 new tabs in the buses spreadsheet. Tom stated the first new tab is for the lines that came from the SECDD section of the EPC file. Tom showed this new tab labeled "all-lines". Tom showed this new tab labeled "all-transformers". Tom stated that the transformer section of the EPC file contains both 2 winding and 3 winding transformers which are not split out like the ASPEN DXT file format. Tom stated that he extracted all of the primary and secondary winding names, but did not extract the tertiary bus information. Tom stated that he did not do this because the tertiary should not be needed to determine who the owner of a seams bus is. Tom stated that when a branch or a transformer is connected between two buses, the owners of the buses can be found from the bus information in the "all-buses" tab. Tom stated that there are two possibilities for the seams bus when there are different owners on each side of an element. Tom stated that the lines and transformers sheets will be used to find who the owner is. Tom stated that the seams bus is the bus on the side of the element with a different owner than that of the element. Tom stated that this is where the ownership changes, so it determines the seams bus. Tom stated that this is probably the largest part of the work left for the group and that everyone should be working on identifying their seams buses so the group can meet their deadline of July, 2007 for completing the case. As an action item, Tom Field will put together a procedure with screen shots to show how to sort an excel spreadsheet by owner to help the members determine where their seams buses are.

The next action item was for Tom Field to generate a list of the types of errors to be fixed and send to everyone before they send their fixed cases back. Tom stated that this was a sequential task that was dependent on knowing all the errors. Tom stated that he would do this after Electrocon has finished making revisions to Cape since the messages have changed some in the last revision checked.

The next action item was for the entire group to make a list of the errors not in their data and identify whose data the error is in. Tom stated that this is a sequential task that was dependent on other action items being accomplished first. Tom stated that the list of problems needed to be finished before this task could be accomplished. Tom stated that since most of the errors are in sections outside of the owner's data which would be replaced with the correct data from other members sections, he was not sure that this was something that needed to be done. Tom stated that he would like to discuss removal of this action item when Maria returns since she was the one that initiated this action item. This is still an open action item.

The next action item was for David Gutierrez to look at the COX transformers and remove one of them if it is not there. David stated that the case represents real life. David stated that one of the transformers was normally open. As an action item, Ron Onate stated that he would look at the message and report to Electrocon that Cape should not be generating this warning message if one of the transformers is offline.

The next action item was for SRP to fix the problems in the SRP case identified and send the fixed case back to Tom F. for a second round of error checking. Tom stated that he had not received a revised case from SRP yet. This is still an open action item.

The next action item was for Ron Onate to fix the problems identified in the APS case and send the fixed case back to Tom F. for a second round of error checking. Ron stated that he had not had time to do this yet due to the error checking work. This is still an open action item.

The next action item was for WAPA to fix the problems in the WAPA case identified and send the fixed case back to Tom F. for a second round of error checking. Tom stated that he had not had time to do this yet due to the error checking work. This is still an open action item.

Tom stated that the rest of the action items on problems in the cases would be discussed in more detail during the "Check of Members Cases" agenda item, but he would go through a brief update right now.

The next action item was for Ron Onate to fix the bus names and kVs that are duplicates in the APS case. Ron stated that this had been done. This case has not been submitted yet as shown in the most recent APS error checking file APSPRER2C.REP.

The next action item was for Ron Onate to look further into why 1 of the switches was not added in the APS log file and contact Electrocon if the report is incorrect. Ron stated that this had been done. Ron stated the problem was that two switches were in parallel and Cape removes one of them. Ron stated the removal of a parallel switch is not a problem.

The next action item was for Tom Field to send the correct generator data to TEP. Tom stated that it turned out to be an equivalent not on the TEP system, but in another member's area. Tom stated that since it was not a real generator, Ron and he decided this would not be done. Tom stated that they put in some parameters to get around the error. As an action item, Tom Field will tell TEP what was done during the error checking to get around this problem in the TEP case.

The next action item was for Ron Onate to develop a list of what characters are not accepted in Cape. Ron stated that this had been done.

The next action item was for Tom Field to send the list of characters not accepted in CAPE to the group. Tom stated this had been done and showed the email with the list of characters that are accepted in CAPE. Ron O. stated that the short bus names are hard to identify sometimes. Tom stated that more information can be put in about a bus in the location field of Aspen. Tom stated that the location in Aspen is the substation field in Cape.

The meeting was adjourned at this point for lunch from 12:00 pm to 12:30 pm.

The next action item was for Ron Onate and Tom Field to check the IID case and put it on the website. Tom stated this had been done.

The next action item was for Ron Onate and Tom Field to have a teleconference with Aspen and Electrocon to try and get them to form an agreement to share information needed for data conversion between the two programs. Tom stated that while the teleconference was being coordinated, Electrocon proposed using PSS/E as an intermediate format so Electrocon and Aspen would only need to update one set of conversion routines in the future. The email sent by Electrocon was shown. Tom stated that the Aspen response was supportive, but indicated that there are some elements in Aspen and CAPE which are not supported by PSS/E which could cause some difficulties.

Tom stated that during the teleconference on November 15, both Electrocon and Aspen agreed to update their PSS/E programs in the future as an intermediate conversion. Tom stated that Electrocon and Aspen pointed out that some elements such as MOVs, zigzag transformers, and spark gaps would have to be handled with comment cards so PSS/E does not have a problem with the new file format. Tom stated that they both said that their PSS/E conversion routines would have to be modified to read and write the special data. Tom said that they agreed to coordinate their work.

Tom stated that Electrocon agreed to continue fixing the problems that the SWAT SCWG was finding with the existing conversion routines in CAPE so the working group could finish their case. An email after the teleconference was shown in which Electrocon stated that they discussed how the PSS/E conversions could be made to include the elements not supported by PSS/E. The zigzag transformers pointed out by Aspen were not in the list, but the list may need to contain other elements as well.

The next action item was for Ron Onate and Tom Field to rerun the cases after Electrocon fixes the DD transformer conversion problem. Tom stated this had been done and that the problem had been fixed.

The next action item was for Ron Onate and Tom Field to look into the “secondary voltage difference more than 20” problem in the NPC case and determine what the message means and what the problem is. Tom stated that the problem did not appear in the 3rd modification of the NPC case when the revised CAPE program was used, so they could not look further into this problem. Kevin S. stated that sometimes another entities voltage for the system may be different than that used in their transformers and that this may be the problem. Kevin stated that as an example, one system may use 500 kV, but NPC uses 525 kV for their transformers.

The next action item was for Ron Onate to look at the 19 transformers with duplicate ckt, 19 neutral buses added, and 19 bus ties added in the SRP case to determine if they were the same. Ron stated that this was just a coincidence and that some of the buses were different for the different types of messages.

The next action item was for Ron Onate and Tom Field to look into the cause of the “mutual couplings ignored because bus not found” warning message in the TEP case. Tom stated this had been done and the problem was found to be that a branch mutually coupled was out of service.

The next action item was for Ron Onate and Tom Field to look into the cause of the “end buses were not found on bus ties” warning message in the TEP case. Tom stated that this had been done and the problem was found to be due to CAPE removing switches when more than one is attached to a bus.

The next action item was for Ron Onate and Tom Field to look at what changed during the conversion process for the APS case to give the differences between the pre and post cases. Tom stated that the comparison had been run and some problems were looked into, but all the problems looked at were related to the multiple switches. Tom stated that there was no improvement in the pre and post comparison. Tom stated that this would be done again after the fix for the multiple switches was received from Electrocon. Tom stated this is still an open action item.

The next action item was for Ron Onate and Tom Field to rerun the SRP faults after the meeting and look at the differences if they are the same to find out why there were differences between Aspen and Cape. Tom stated that the comparison had been run and there was no improvement in the pre and post comparisons to Cape. Tom stated that this would be done again after the fix for the multiple switches was received from Electrocon. Tom stated this is still an open action item.

The next action item was for Ron Onate and Tom Field to look at the differences in the Cape and post results for the WAPA case to find out what the differences are due to. Tom stated that the comparison had been run and this problem had been eliminated.

The next action item was for Ron Onate and Tom Field to perform a second round of error checking on the TEP case and generate the comparison spreadsheet. Tom stated this had been done, but has to be redone with bus numbers because there were too many buses with a bus number of 0 for a full comparison. Tom stated this is still an open action item to be completed when the buses are renumbered.

The next action item was for Ron Onate to discuss a plan for the equivalents checking work with Steve after the meeting. Ron stated this had not been done. Tom stated that since Steve has a heavy workload, something needs to be done so this action can move along. Tom stated this would be discussed in more detail during the “Equivalents” agenda item.

The next action item was for Tom Field to send out the agenda for the next meeting with the directions and information provided by Tom S. Tom F. stated this had been done.

Tom F. asked if there were any additional action items that were not in the draft of the meeting minutes. There were no responses.

This concluded the update of all action items in the list from the October meeting minutes. Tom stated that there were some other things that had occurred since the previous meeting and that he would give an update on these items.

b) New Items

Tom stated there was an advanced Aspen training class that would be held in San Francisco from March 21-22. The email announcement for this class was shown. Tom stated that many of the topics on the agenda were items that the group would be working with. Tom stated that for in depth Modeling of 3 winding transformers in the class, the test connections internal to Aspen have been, and a few remain, as conversion issues to Electrocon.

Tom stated that for in depth Mutual coupling in the class, all members have agreed to work on mutual coupling in the second case we develop, but the group will have to deal with mutual coupling in the current cases for the first combination. Tom stated that for in depth Network Equivalence in the class, the group is currently waiting to start work on investigating the network equivalents and error to the full network representation in both programs. Tom stated that for in depth Network Anomalies checking, the group has been depending on Cape for its error reporting which is superior to the standard messages reported in Aspen. He stated there may be other things that the group hasn't looked at discussed in the class. He stated that the group has been finding the problems by placing faults at locations with differences and working back to where the difference disappears to find the branches that cause problems resulting in requests to fix the problems found in the programs. Tom stated that perhaps other ways of checking for problems will be discussed. Tom stated that even problems in the data being checked with the CAPE software may have other methods of being found in Aspen that would be taught at the class. Tom stated that for the in depth File-merge command in the class, the group should

start the work on this during this meeting. He stated that all of the members will have to merge their cases. He stated that Cape has offered to sell the members a stand alone program to do exactly what is needed for the combination using the areas, zones, and seams buses. He stated that Aspen has the capability, but the group has not investigated it yet. Tom stated that for the advanced applications of the Case Comparison program, this is something that would be helpful to all members later when updates are made to find the changes. Tom stated that for Power Script programming, he wrote a program a couple of weeks ago with this language in Aspen for generating sliding fault data. He told them that this would be useful to everyone. Tom stated that he could send the program to the group or put it on the website along with a FORTRAN program he wrote for extracting the data.

Tom asked if anyone was planning to go to the Advanced Aspen course. He stated that his workload may not permit him to go and most of the other members stated that they would not be able to attend. Kevin S. stated that he would be going. Tom asked Kevin if he would be willing to provide the materials from the class to the group. Kevin stated that he would. As an action item, Kevin S. will provide the documentation and programs from the Advanced Aspen class to the SWAT SCWG.

Tom stated that there was an IEEE PSRC meeting held in Phoenix from January 8th through January 11th. Tom stated that Mike Agudo attended the meeting and would give a presentation on the working group meetings he attended at the next SWAT SCWG meeting. Tom stated that there are several working group meetings held in parallel during this meeting, so it would be helpful if each member that attended reported on the meetings that they participated in so everyone would benefit from a combined cooperative SWAT effort for information sharing on IEEE protection work. As an action item, everyone will check with their company to determine if anyone attended the January 2007 IEEE PSRC meeting and, if so, ask them to give a brief report to the group.

Tom stated that the next SWAT meeting will be held on January 30 in Phoenix. As an action item, Tom stated that he would not be able to attend due to his workload, but would provide a report to Ron Moulton to give to SWAT. As an action item, Tom stated that he would provide the update given to SWAT to the SWAT SCWG at the next meeting.

Tom stated that there was an inquiry about membership in the SWAT SCWG by Navigant Consulting in California. He stated that any member of SWAT that was a WECC member could request membership in the group. He stated that after SWAT gives approval for membership, the group would have to approve the membership. He showed the email sent to Navigant with this information. He stated that Navigant responded with a request for the procedure to become a member of SWAT. He stated that his response was that Rob Kondziolka should be contacted and that he copied Rob on the email. Tom stated that this was an interesting request because their office was in San Diego.

Tom stated that there was another inquiry by Alberta about the status of the work. He stated that his response was that he would provide the information when the work was complete and showed the email.

Tom asked if anyone had any other old or new items to discuss before going on to the next agenda item. There were no other items brought up for discussion.

2) PTI to Aspen Conversions

The meeting continued with the next agenda item on PTI to Aspen Conversions. Tom stated that he had not had time to perform any additional work on the PTI to Aspen conversions since the previous meeting. Tom stated that he may do some work on this with NPC before the next meeting.

This concluded the PTI to Aspen conversion agenda item.

3) Check of Members Cases

The Check of Members Cases agenda item was covered next. Tom stated that the IID case had been checked, the 3rd round of error checking had been performed on the NPC case, the 2nd round of error checking had been performed on the EPE and TEP cases, and the SRP, APS and WAPA cases were checked again after changes to CAPE.

Tom stated that he and Ron met for 3 full days to perform the error checking. He stated that these days were November 2, November 15, and January 17. He stated that during the November 2 meeting, the IID, TEP, NPC, WAPA, APS, and SRP cases were rerun and the files were generated. He stated that the action items related to these cases were worked on. He stated that the previous problems in the NPC case were worked on. He stated that during the November 15 meeting, a teleconference was held with Aspen and Electrocon for future updates to the conversion routines. He stated that the previous problems found in the TEP case and the previous problem action items were investigated. He stated that new problems were found during this work. Tom stated that Ron and he decided that due to the problems found, they would wait for further program modifications before rerunning all the files.

Tom stated that the DD transformer problem had been resolved and showed the Aspen screen shots before and after conversion which verified this.

Tom stated that for the “Duplicate ckt” message for lines and transformers, they found that the “wdg” numbers are actually the bus numbers even if it is a line. He stated that with this information, the problems can be looked at to see if the circuit number should be changed by the members.

Tom stated that for the missing switch in the APS log file, they found that there were two switches in parallel. He stated that Cape does not allow 2 switches to be in parallel and removes one of them. An email from Electrocon in response to this problem was shown.

Tom stated that the “Mutual couplings ignored because bus not found” warning message in the TEP case was due to one of the lines being coupled having an offline status which caused the message to be generated.

Tom stated that the “19 transformers with duplicate ckt”, “19 neutral buses added”, and “19 bus ties added” messages in the SRP case were found to be at different buses. He stated that it was just a coincidence that there were 19 for each of these.

Tom stated that the “secondary voltage difference more than 20” problem in the NPC case could not be reproduced in the revised NPC case using the current revision of CAPE.

Tom stated that the “end buses were not found on bus ties” warning messages in the TEP case were due to more than 1 switch connected to one of the buses. He stated that Cape removes all but one of the switches when multiple switches are connected to a bus. He stated that this is what caused this message. He stated that all of the mismatches looked at in the APS case involved removal of switches or equipment taken offline with switches. He stated that the version of Cape used on January 17 did not put this message in the output, but the problem was still not resolved. As an action item, Ron Onate will contact Electrocon and request that they add a message back to the output file when this problem is in the case. Tom stated that this problem is still not resolved, but should eliminate most of the mismatches in the APS case when it is fixed.

Tom stated that on November 15, some new problems were found. Tom stated that because of these new problems, and the problem with the switches, Ron and he decided that they should not continue until Electrocon made some changes to the program. Tom showed an email that was sent to Electrocon on the new problems found.

Tom stated that the first new problem found was a YYD transformer in the TEP case. The drawing of this transformer in the Aspen case before conversion was shown first which has the delta as the high voltage side and two Y connections as the low voltage sides. The error message in Aspen after the case is converted back from Cape was shown which indicated an illegal transformer connection. The transformer data in Aspen before conversion was shown which puts the delta as the tertiary. Tom stated that this is the only configuration which Aspen supports for this type of transformer. The transformer data in Aspen after conversion was shown. Tom stated that Cape moves the high voltage winding to the primary which is not supported by Aspen. Tom pointed out that the use box was not checked for the primary winding because Aspen does not recognize this type of connection. Tom showed an email response after the problem was reported dated December 4 from Electrocon in which they stated they were revising the program to correct this problem and then an email from Electrocon on January 21 which stated that the problem had been corrected. Tom stated that this problem had not been corrected in the version of Cape used on January 17. Tom stated that their December 4 email indicated that Electrocon was also looking for other places that could have conversion errors that the SWAT SCWG had not identified yet.

Tom stated that the second new problem found was related to the TEP “end buses not found” problem. Tom stated that some of the APS case mismatches above 100 A were looked at on November 15. Tom stated that all of the mismatches investigated resulted in finding buses where switches had been removed. Tom stated that the problem was that Cape automatically removed all but one switch when more than one switch is connected to a bus. Tom showed one example of the Aspen case before conversion to Cape which had two switches connected to a bus and the Aspen case after conversion back from Cape which had only one switch connected to the bus. Tom stated that these were not parallel switches, so this is a significant problem in Cape for the APS case which uses switches to sectionalize buses in stations for breaker duty evaluations. Tom showed an email dated January 21 from Electrocon in which they stated that they could not find the problem. Tom stated that apparently, they removed the error message related to the TEP problem and did not correct the cause of the message which was removal of switches when they were not in parallel. As an action item, Ron Onate and Tom Field will call Electrocon if their latest version does not fix the problem, send Electrocon the files that should clearly show this problem, and make sure they can see the problem so they can fix it.

Tom showed an email response from Electrocon received after the November 15 meeting in which they stated that they would have a corrected version in ten days. Another email from January 21 was shown in which Electrocon stated that they had a new release with solutions to problems which was their December 8 release.

Tom stated that Ron and he met on January 17 after Ron installed the newest version of Cape that he had received from Electrocon on CD after the November 15 meeting. Tom stated that they reran the TEP, NPC, IID, WAPA, SRP, and APS cases. Tom stated that comparisons of the outputs were made in spreadsheets for each of the cases and that the latest files were all on the website. Tom stated that the YYD transformer and the multiple switch problems were still not resolved in the version used on January 17.

Tom stated that the version of Cape used on January 17 had some significant improvements in the singularity checking and that the zero sequence data is now correct in the report. Tom stated that a new error message appeared in the NPC output that was not in the version used on November 15. The error message was that Cape was “unable to treat connected isolated groups at buses 324 CO and 325 CO”. Tom stated that after this, there was a suggestion in the message to look for ungrounded neutral nodes and that this message appeared after a singularity list. Kevin S. looked at the buses 324 and 325 in the NPC case and stated that he did not see any problems at these two buses. Kevin stated that the names of the buses were not “CO”. Ron O. stated that “CO” is a type of bus in Cape and not a name. As an action item, Ron Onate and Tom Field will look at the two buses to try and find what is causing this new error message.

Tom stated that the EPE case checked with the Cape software on November 15 stated that there were 191 transformers in the log file, but the same case checked with the revised Cape software on January 17 that there were only 187 transformers. Tom stated that there was a similar observation for the TEP case which reported 451 transformers on November 15 and 450 transformers on January 17. As an action item, Tom Field and Ron Onate will look into the problem and determine whether the number of transformers reported before was incorrect, if the new number of transformers reported is incorrect, or if Cape is now removing transformers.

Tom stated that the comparison spreadsheets did not show any differences in the IID case over 2 A on any of the comparisons. He stated that the TEP case had too many buses without a number, so only the post to Cape comparisons were useful. He stated that the SRP and APS cases still have problems, but the investigation into the WAPA case comparisons was resolved in the version of Cape used on January 17. Tom stated that he would go through the case comparisons in more detail.

Tom stated that for the EPE pre to post comparison, there were only 7 buses with a difference of 100 A or more. He stated that the first two buses were shown as different, but they were actually the same bus. He stated that the bus name was blank for one because the number was changed by Cape for some reason. He pointed out that Cape did rename this bus because there was a space in the name which is replaced by an underscore in Cape, but this should not have been a reason for Cape to renumber the bus. As an action item, Ron Onate and Tom Field will investigate why the bus number was changed for the Westmesa T3 bus in the EPE case. Tom stated that the three phase difference was zero on 6 of the 7 buses with a difference of more than 100 A. He stated that this indicated that Cape was changing something related to the zero sequence. As an action item, Ron Onate and Tom Field will investigate why there is a single line to ground fault difference on these 6 buses and not a three phase fault difference.

Tom stated that for the EPE case, there were 56 buses with a difference of 100 A or more between the pre and Cape cases and 50 buses with 100 A or more difference between the Cape and post cases. Tom stated that this indicates a solution algorithm difference between Cape and Aspen. As an action item, Ron Onate and Tom Field will investigate the cause of the 43 buses with 100 A or more difference in just the Pre to Cape and the Cape to Post comparisons.

Tom stated that for the NPC pre to post comparison, there were 18 buses with 100 A or more difference. He pointed out that many of the differences have bus number differences which indicates Cape has either renumbered a bus or removed it. He stated that many were bus removals because the names did not include characters that were not accepted by Cape. He stated that most of the buses shown appeared to be generators. Kevin S. stated that these buses were generator buses. As an action item, Ron Onate and Tom Field will investigate the generator bus differences over 100 A before and after conversion to find the cause of the difference. Tom stated that he suspects that Cape is changing something in the GSUs based on previous transformer problems found in the conversion software.

Tom stated that for the NPC case, there were 79 buses with a difference of 100 A or more between the pre and Cape cases and 36 buses with 100 A or more difference between the Cape and post cases. He stated that the 36 differences may be explained or resolved when the cause or solution to the problem was found with the 43 EPE buses to be investigated in the pre to Cape and Cape to post comparisons. He stated that most of the 79 differences may be explained or resolved when this is done as well as the cause or solution to the 18 buses with a difference between the pre and post cases in the NPC is investigated.

Tom stated that for the TEP case, there were 12 buses with a 100 A or more difference. He pointed out that some were due to the SLG fault only which was being investigated in the EPE case. He stated that after the buses are numbered, a better investigation of the differences and solutions to the problems in the TEP case can be performed.

Tom stated that the previous problems in the APS, SRP, and WAPA comparisons were investigated. He stated that the pre to post comparisons in the WAPA case were reduced from 22 to 16, the pre to Cape comparisons were increased from 25 to 38, and the Cape to post comparisons were reduced from 133 to 22 buses with 100 A or more difference. He stated that the latest version of Cape used appears to have removed the previous problem which was a high difference between just the Cape to post solutions. He pointed out that while this problem was resolved, there was an increase in the number of pre to Cape comparisons with 100 A or more.

Tom stated that the SRP pre to post comparisons were reduced from 12 to 11 buses with 100 A or more difference. He stated that the pre to Cape comparisons increased from 134 to 159 buses with 100 A or more difference similar to the increase in pre to Cape bus differences in the WAPA case. He stated that the Cape to post comparisons increased from 123 to 149 buses. Tom stated that the previous problem investigated was the Cape to post and Cape to pre comparisons being high, but the pre to post comparisons being low. Tom stated that this problem was not resolved with the latest version of Cape and the use of small switch reactances, but, rather, became worse. As an action item, Ron Onate and Tom Field will look at this problem again after the next revision of Cape. Tom stated that this may be explained or resolved when the 43 buses in the EPE case with differences in the pre to Cape and Cape to post comparisons are explained or fixed.

Tom stated that the APS pre to post comparisons remained at 313 buses, the pre to Cape comparisons remained at 317 buses, and the Cape to post comparisons remained at 57 buses. He stated that the previous problem investigated was the pre to post and Cape to pre comparison being high, but the investigation resulted in no change using the latest version of Cape and small switch reactances. Tom stated that this indicated a problem in the initial Aspen to Cape conversion because the Cape to Post comparison was much lower. Tom stated that the other problems being investigated should eliminate many of the problems. He stated that most will probably be due to the elimination of switches during the initial conversion from Aspen to Cape. As an action item, Ron Onate and Tom Field will investigate these differences after the switch removal problem in the conversion software reported to Electrocon has been fixed.

Tom stated that Ron O. sent an email to Electrocon on January 23 requesting a CD with the latest version of Cape to see if they have fixed the switch problem yet. He stated that they would not rerun the cases until the switch removal problem was resolved. He stated that after this problem is fixed, the cases will be rerun, new comparisons will be made, and the cause of the remaining problems will be investigated.

This concluded the Check of Members Cases agenda item.

4) WestConnect Map Work Proposal

The WestConnect Map Proposal agenda item was covered next. Tom stated that the last WestConnect meeting was held on January 18 in Las Vegas and the next WestConnect meeting will be held on February 15 in Phoenix. He stated that he had not heard anything from WestConnect since the last SWAT SCWG meeting. As an action item, Don Adams stated that he would make the map for the SWRTA case and send it to Tom F. to place on the website.

This concluded the WestConnect Map Work Proposal agenda item.

5) Areas and Zones in Cases

The Areas and Zones in Cases agenda item was covered next. Tom stated that he had only one response on the mutual, equivalent, and seams zones. He stated that he had one response on the seams buses and one response on bus numbers different from WECC which was from SRP. He said that he did not have any response yet on the split bus information and that most of these will probably be in the APS case. Tom stated that everyone needs to send their information on their seams before others can finish the preparation of their cases for the combining.

The areas and zones data in the spreadsheet was shown. As an action item, Don Adams stated that he would send Tom F. the zones that SWRTA will use for the areas and zones spreadsheet. Tom stated that at a minimum, everyone should send in the seams zone number that they want to use so others can complete their cases for the combination. Tom stated that while SRP identified their seams buses, bus numbers, and names, they did not indicate which zone they wanted to use for their seams buses yet. The new SRP bus data in the buses spreadsheet was shown. Tom stated that he liked the way SRP put in a column to indicate if a bus was a seams bus. He pointed out that another column was added for the bus number that SRP wanted to use. It was pointed out that the highlighting was also useful for quickly finding these buses. Tom suggested that the format used by SRP should be used by everyone. Everyone agreed. As an action item, everyone will use the SRP spreadsheet format for their seams buses. It was pointed out that zone 150 was used for the seams buses and other zones. Tom stated that SRP will have to change this to a unique zone. He stated that SRP was waiting for some additional zones from WECC which may be why they did not use a unique zone yet for their seams buses.

This concluded the Areas and Zones in Cases agenda item.

6) Equivalents Update

The Equivalents agenda item was covered next. Tom asked Ron if there was any work done on the equivalents since the last meeting. Ron stated that he had not had time to do anything with the equivalents since the last meeting and had not heard anything from Steve yet.

Tom stated that since Steve had a heavy workload with his case integration, he would like to ask if anyone would have time to take over the equivalents investigation using Aspen. As an action item, Don Adams stated that he would investigate the equivalents in Aspen. Don asked what the work was that he needed to do. It was pointed out to him that this information was in the previous minutes. As an action item, Tom Field will send this specific information to Don A.

This concluded the Equivalents Update agenda item.

7) SWAT SCWG Task Force for East Nevada Short Circuit study

The SWAT SCWG Task Force for the East Nevada Short Circuit Study Group (EN-SCSG) agenda item was covered next. Tom stated that SPPC/NPC had declined to chair the task force. Tom Field stated that he would chair the task force if there were no objections and nobody else wanted to chair it. Tom asked if anyone wanted to chair the task force. There were no offers to chair the task force. Tom asked if anyone would object to his chairing the task force. There were no objections.

Tom stated that he will talk to TEP/Unisource about being a member before the next meeting because they could be impacted around the Kingman area. Tom asked Robert S. if IID would like to be a member since they could also be affected by the impacts and some of the people in Southern California which will need to be a part of EN-SCSG will also be the people IID is working with on combining a case for their boundary. Robert S. stated that he would like to be a member for now and would talk to David B. further about it after the meeting. Tom F. stated that SWTC may also want to be a member due to possible impacts on some of their assets.

Tom stated that he had not received any new information since the last SWAT SCWG meeting on the EN-SCSG. He stated that since the workload of Alex had caused the EN-SCSG work to slow down for now and the SWAT SCWG could not do much more for the EN-SCSG until the SWAT SCWG case was completed, this should not be a problem for now. Tom stated that anyone in the group that would like to be a member can become a member since there is a delay for now. As an action item, Tom Field will send any information on the EN-SCSG to the SWAT SCWG. Tom stated that any member that sends in a request to be on the EN-SCSG task force will be put on the task force.

This concluded the SWAT SCWG Task Force for East Nevada Short Circuit study agenda item.

8) Case Combination

The Case Combination agenda item was covered next. Tom stated that both Aspen and Cape have methods of combining the cases. He stated that Electrocon suggested use of their program due to the way the seams buses were being setup. He stated that both the Electrocon program and Aspen need to be evaluated to determine if there are any problems with the mechanics or if one works much better than the other.

An email from Electrocon on November 15 was shown in which Electrocon stated that "Cape is the perfect tool for doing this" in reference to combining the cases the way they are being conditioned. Ron O. stated that the program is already in Cape. Tom F. stated that the group shouldn't put the burden on Ron to combine all of the cases and that if the Electrocon stand alone program that was offered for a fee to the group was found to be superior to any problems found in Aspen, the group could purchase it and combine their own cases with it. As an action item, Ron Onate will evaluate the merging of two cases with the Cape program.

Tom stated that a volunteer is needed to check the Aspen method. He stated that since Kevin will be going to the advanced Aspen class which will go in depth in case merging, this would be a good opportunity for him to investigate it before the class. As an action item, Kevin Salsbury will evaluate the merging of two cases with the Aspen program.

Tom stated that the same case should be used on Aspen and Cape for the merge evaluations. He stated that this should be done using a small case with 3 zones. He stated that 2 of the 3 zones should be extracted to a Case 1 and 2 of the 3 zones should be extracted to a Case 2. He stated that only 1 of the zones should be common to both Case 1 and Case 2. He stated that this common zone would be the seams zone. He stated that Case 1 and Case 2 should be used for the merging into a single case. Tom stated that Ron and Kevin should identify the problems they find in combining these two cases.

Tom stated that they have a couple of small cases that could be used, but they don't have zones in them. As an action item, Tom Field will put 3 zones in the IID case and send to Kevin S. As an action item, Kevin Salsbury will extract a Case 1 and a Case 2 and send them to Ron O. for use in evaluation of the Cape merge mechanics.

Tom stated that during the last update to SWAT, he reported that the case combination work would be started at this meeting. He stated that there were action items developed at this meeting for working on the mechanics of joining two test cases. Tom asked if everyone agreed that the next report to SWAT should state that the case combination work had been started. Everyone agreed.

This concluded the Case Combination agenda item.

9) Determine Location of Next Meeting

The last agenda item, Determine Location of Next Meeting, was covered next. Tom stated that his workload at WAPA would not allow him to participate in the next meeting until the end of March. He stated that the best two days for the next meeting that he could attend would be Tuesday, March 27 or Wednesday, March 28.

Tom stated that before discussing the next meeting date, he wanted to point out that another member could run the next meeting in February. He stated that the 3rd Thursday of the month conflicts with the Phoenix IEEE PES meetings. He stated that Steve C. requires a Tuesday or Wednesday to participate in the meetings.

Tom asked the group if they wanted to have the next meeting in February or March. Everyone agreed to have the next meeting in March. Tom asked what day in March would work best for everyone. Some responded that Tuesdays work best for them. Tom asked if everyone would like to have the next meeting on Tuesday, March 27. Everyone agreed to have the next meeting on Tuesday, March 27.

Tom asked if the time of 9:30 am to 4:00 pm should be changed for the next meeting. Everyone agreed that the next meeting should be from 9:30 am to 4:00 pm.

Tom stated that all of the members have hosted a meeting except IID. Tom asked Robert S. what the flight schedule into IID was like. Robert stated that there was a flight in the morning and a flight around noon. Robert stated that the you could fly into Yuma and drive from there to El Centro. Tom stated that the meetings have been about evenly split between Phoenix and other locations because 3 of the members are in Phoenix. Don A. pointed out that SWRTA hosted a meeting in Casa Grande which is also near Phoenix. David G. stated that he would prefer to have all the meetings in Phoenix because it is easier for him to get a flight in and out. Tom asked where everyone would like to have the next meeting. Everyone agreed that the next meeting should be in Phoenix. Tom stated that WAPA hosted 2 meetings in Phoenix, APS hosted the last meeting in Phoenix, and suggested that the next meeting be hosted by SRP. Everyone agreed that the next meeting should be hosted by SRP. Tom stated that SRP was not at this meeting, so they would have to be contacted to determine if they could host the next meeting. As an action item, Tom Field will contact Maria R. to see if SRP can host the next meeting. Ron O. stated that if SRP cannot host the next meeting, he will look into hosting the next meeting at APS. Tom F. stated that if SRP cannot host the next meeting and APS cannot host the next meeting, WAPA will host the next meeting.

As an action item, Tom F. will send out the agenda for the next meeting with the directions and information provided by the host of the next meeting. Tom F. asked if there were any other items that anyone would like to bring up. There were no other items brought up. The meeting was adjourned at approximately 3:45 pm.



SWAT SC Working Group

January 25, 2007

9:30 AM to 4:00 PM Mountain Time

**Location: Trico Electric Cooperative
Meeting Room
8600 W. Tangerine Road
Marana, AZ 85653**

Meeting called by: SWAT SC Working Group

Purpose: SWAT SC Working Group meeting to review short circuit items of mutual interest for the SWAT system.

----- Agenda Topics -----

1. **Introductions, Approval of Previous Meeting Minutes, and Update on Action Items**
2. **PTI to Aspen Conversion – Tom Field**
3. **Check of Member Cases – Ron Onate and Tom Field**
4. **WestConnect Map Work Proposal**
5. **Areas and Zones in Cases**
6. **Equivalents – Ron Onate and Steve Conrad**
7. **SWAT SCWG Task Force for East Nevada Short Circuit Study Group**
8. **Case Combination**
9. **Determine Location of Next Meeting**

Meeting Location Instructions:

Lunch will be brought in at noon and the meeting will resume at 12:30.

Call (520) 744-2944 if you need to contact the main lobby at Trico.

Sign in at the front desk and they will direct you to the meeting room.

Please see attached maps for directions from Tucson and Phoenix. Trico is just east of I-10 about 1 mile so it is very easy to get to.





SWAT SCWG

October 26, 2006 Meeting



Agenda

----- Agenda Topics -----

- 1. Introductions, Approval of Previous Meeting Minutes, and Update on Action Items**
- 2. PTI to Aspen Conversion – Tom Field**
- 3. Check of Member Cases – Ron Onate and Tom Field**
- 4. WestConnect Map Work Proposal**
- 5. Areas and Zones in Cases**
- 6. Equivalentents – Ron Onate and Steve Conrad**
- 7. SWAT SCWG Task Force for East Nevada Short Circuit Study Group**
- 8. Case Combination**
- 9. Determine Location of Next Meeting**

Introductions

SWAT SCWG Members

[Tom Field](#) WAPA

[Don Bryce](#) USBR

[Dennis Delaney](#) SWRTA Class Two Consultant

[Steve Phegley](#) APS

[Maria Ramirez](#) SRP

[Gary Trent](#) TEP/Unisource

[Tom Spence](#) SWTC

[Steve Conrad](#) PNM

[David Barajas](#) IID

[Jorge Barrientos](#) IID alternate

[David Gutierrez](#) EPE

[Kevin Salsbury](#) - NPC/SPPC

[Michael Gazda](#) - APA

[Bill Middaugh](#) - [CCPG](#) Liaison

Approval of October 2006 Meeting Minutes

SWAT SCWG Meetings

January 2006 Meeting [Notes](#)

February 2006 Meeting [Notes](#)

March 2006 Meeting [Notes](#)

April 2006 Meeting [Notes](#)

May 2006 Meeting [Notes](#)

June 2006 Meeting [Notes](#)

July 2006 Meeting [Notes](#)

August 2006 Meeting [Notes](#)

September 2006 Meeting [Notes](#)

October 2006 Meeting [Notes](#) (unapproved)

January 2007 [Agenda](#) (draft)

Update on October Meeting Action Items

- **Person:** Tom Field
- **Action Item:** Show the September meeting minutes on the website as approved.

- **Person:** Tom Field
- **Action Item:** Investigate the latest change made by Aspen which is supposed to take care of the transformer problems in the PTI to Aspen conversion.

- **Person:** Tom Field
- **Action Item:** Rerun the DPV2 case and check to verify that the charging was not set to zero originally since the screen shot showed the “set charging to zero” as checked for the new aspen transformer option comparison of PTI to Aspen.



Update on October Meeting Action Items

- **Person:** Mike Agudo
- **Action Item:** ask Lane C. of WAPA if he went to the October 16, 2006 Western Protective Relay Conference and if he did, he would ask him if he would provide a report to the group.

- **Person:** Maria Ramirez
- **Action Item:** find out who at SRP attended the Western Protective Relay Conference and ask them if they would give a report to the group on the meeting.

- **Person:** Tom Field
- **Action Item:** place a link to the Western Protective Relay Conference on the SWAT SCWG website.



Links for Groups

Links

IEEE Power System Relaying Committee (PSRC) [website](#)

WECC Relay Working Group (RWG) [website](#)

IEEE Switchgear Committee [website](#)

Western Protective Relay conference [website](#)

Update on October Meeting Action Items

- **Person:** Tom Field
- **Action Item:** Compile SWTC reclosing questionnaire responses and post them in an encrypted file on the website.

- **Person:** Tom Field
- **Action Item:** Send Tom S. the SWAT SCWG encryption information after the meeting.

- **Person:** Tom Spence
- **Action Item:** Provide reclosing working group information to Tom F. to put on website.



Update on October Meeting Action Items

- **Person:** Kevin Salsbury
- **Action Item:** Contact Alex F. and obtain the date for the next EN-SCSG meeting.

- **Person:** Kevin Salsbury
- **Action Item:** Send the address of the EN-SCSG webpage to Tom F. to place on the SWAT SCWG webpage.

- **Person:** Tom Field
- **Action Item:** put the EN-SCSG link to the webpage on the SWAT SCWG webpage.



Update on October Meeting Action Items

- **Person:** Tom Field
- **Action Item:** contact Alex F. and ask him to chair the EN-SCSG task force.
- November 3, 2006 email from Alex

Hi Tom,

I'd prefer that you chair the task force. I might not be able to participate in all SCWVG meetings and such, since I have other responsibilities and my management already feels that I spend too much time on the SCSG.

Update on October Meeting Action Items

- **Person:** Tom Field
- **Action Item:** talk to TEP about TEP/Unisource being a member of the EN SCSG. Tom S. of SWTC did not state whether or not SWTC wanted to be a member.

- **Person:** Tom Field
- **Action Item:** arrange a teleconference with SCE, SDGE, CFE, IID, and SWAT for the Southern California short circuit case the week after the SWAT SCWG meeting.



Background Information sent to Teleconference Participants

The SWAT SCWG started working on combining the cases of the utilities in the SWAT footprint in 2006. As part of the work for this group, they would like to have the utilities adjacent to the SWAT footprint develop similar cases. The SWAT SCWG has agreed to share their case with the combined cases of the adjacent utilities if they reciprocate and provide their combined case. While CCPG has been working on a case this year as well, there is no such collaborative effort in Southern California. A presentation was given to STEP in May of 2006 recommending formation of a SCWG, but such a group has not been formed by STEP.

One of the SWAT members, IID, expressed a desire to have a better arrangement with the Southern California utilities on the Western boundary which would include sharing the annual SWAT SCWG case with an annual case from it's boundaries utilities to eliminate the need for equivalents in the future. In an attempt to get such an arrangement, a teleconference was held with SWAT, IID, SCE, and SDG&E on August 23, 2006. SDG&E and SCE expressed an interest in forming a combined case and SCE stated they would poll other utilities in California to see if they would be interested in combining their cases. SCE did not see a problem with combining their case with others. SDG&E stated they did not think it would be a problem, but would have to research it first.

On August 6, 2006, SCE informed Tom Field that there was not much interest from the Southern California utilities to combine their cases. On September 25, SCE stated that they would contact SDG&E to see about combining their cases and that the other utilities in California would probably join after they get it started in lieu of a formalized STEP or CAISO initiative. On September 25, SDG&E informed SCE that they may be willing to combine their case with SCE if CFE were to join the process. IID was contacted on September 25 about discussing the initiative with CFE. On October 23, IID informed Tom Field that CFE would be willing to participate in this effort.

Teleconference with SDG&E, SCE, CFE, IID, SPPC and WAPA on November 8, 2006

A teleconference on the Southern California/Northwest Mexico combined short circuit case was held on November 8 with Jose Santamaria from CFE, Brad Bentley from SDG&E, Gary Chin from SCE, and Amos Ang of SCE. Others on the teleconference were David Barajas with IID, Robert Sanders with IID, Alex Fratkin with SPPC/NPC, and Tom Field with WAPA. The teleconference was held between 2 pm and 3:30 pm Pacific Time.

The discussions resulted in a recommendation to have a second teleconference with Howard Ham of the protection group at SCE, Bill Cook of the protection group at SDG&E, and Jose Santamaria of CFE. Therefore, I would like to ask each of you to respond with a date that you would be available for a teleconference on the combining of the SCE, SDG&E, and CFE short circuit cases. Can you please let me know if November 14, 16, or 21 is open in your schedules for the teleconference. I will send out the information after receiving a response from each of the 3 stakeholders.

A summary of the teleconference on November 8 is shown written below (based on a handwritten agenda which was not emailed to the participants):

Agreements:

CFE, SDG&E, and SCE each agreed to share their short circuit data with each other in a combined case. CFE and SDG&E each agreed to provide data to the 69 kV level, but SCE was not sure and later wanted to equivalence below 220 kV. CFE stated they use PSS/E, SDG&E stated they use Aspen, and SCE stated they use Cape.



Benefits:

Tom Field stated that the benefits of having a combined short circuit case was having more accurate relay settings, having more accurate safety ground calculations, and having more accurate breaker ratings. Tom Field stated that the protection people will see the most benefit because they are the ones that depend on the accuracy of the database for relay settings and safety ground calculations. Tom stated that the breakers also require more accurate data on the boundaries for circuit breaker ratings than can be obtained with equivalents. Tom stated that Ron Onate of APS had some findings that showed that using equivalents will not give the correct DC offset for breakers when equivalents are in the vicinity instead of the actual system representation.

Mechanics of Combining Case:

Tom Field stated that the combining of cases requires each utility to identify their seams buses and use the same seams bus number in each case connected to a common bus. Tom stated that each utility must identify their equivalents or other systems connected to their system which is not one of the other members systems. Tom stated that each case must have unique zones setup for their data and their equivalents or other systems so they can be stripped out of a case easily. Tom stated that after the cases are conditioned for combining, then an error checking procedure should be performed. Tom stated that after the error checking, the cases would be combined and duplicate bus numbers would have to be changed. Tom stated that after this is done, then the case can be combined with other cases from other regional groups such as the SWAT SCWG and other utilities in California.

Tom stated that the SWAT SCWG used Cape for their error checking because it has a lot of error reporting not found in PSS/E or Aspen. Tom stated that they found problems in all of their cases. Tom stated that it was surprising to find that even a Cape user found problems because they normally do not convert their case back to Cape from another format. Tom stated that there should not be an issue on program choice because SWAT has been working with the vendors to get changes put in the the programs so Aspen, Cape, and PSS/E will be able to transfer data between each without differences in the results.

Tom stated that for the duplicate bus numbers, SWAT had decided that the prefix of the numbers used by the WECC planning case would be added to the duplicate numbers so they would be unique. Tom stated that the SWAT SCWG had an agreement to combine their case with the CCPG (Colorado Coordinated Planning Group) case. Tom stated that CCPG had not combined a case before and neither had SWAT. Tom stated that after the first cases are combined, annual updates would be quick because the cases would automatically merge with updates from each company without the need to setup zones, seams buses, and bus numbers again.

Contacts:

Tom asked who the contacts would be for the next step. SCE and SDG&E both stated that their protection people would be the more appropriate people for this. SCE stated that Bill Cook should be involved and SDG&E stated that Brad Bentley should be involved.

Issues:

SCE and SDG&E both had similar issues. These issues were resources and benefits. They both stated that they did not have the resources to combine the cases and that they would have to have benefits that showed the need for combining the cases to dedicate the resources to conditioning their cases.

For the benefits, Tom Field stated that they had found in SWAT that most of the errors were in the data for other utilities in each case. Tom stated that this was because there was no systematic method in place for updating data from adjacent systems. SCE and SDG&E stated that they were not aware of any problems in their data and that they get equivalents for a project when it is put in. Tom stated that equivalents do not give you enough information about the other systems to keep your data up to date. Tom stated that SWAT was so interconnected, that not having a method to periodically update the adjacent utilities led to wide spreads in results for some stations. Tom stated that the use of equivalents will also lead to the incorrect results for breaker ratings for boundary stations and that APS had data which would showed this. Tom stated that the only way to know if there is a spread in the data in California is to compare the results from the case for faults on every bus. Tom asked if SDG&E, SCE, and CFE had compared their fault data for each bus to determine the error. SCE and SDG&E stated that this would require resources.

SCE and SDG&E stated that they did not see the benefits of dedicating the resources to do this work. Tom Field stated that the reason Alex Eratkin of NPC/SPPC was on the teleconference was because he had a SCSG which would include a task force from California, a task force from SWAT, and a task force from the Utah area that would be generating three separate combined cases for the regions that would then be combined together for a planning short circuit case. Tom stated that this would reduce the time for the California area to combine a case. Tom stated that similar efforts were performed previously on the DPV2 SCWG and the Centennial SCWG. Tom asked Gary Chinn of SCE how long the DPV2 case took to put together. Gary stated that it took approximately a year, but a lot of the time was waiting for people to send data to combine. Tom asked how long it took to combine the Centennial case and it was stated that this took several months. Alex Eratkin stated that these previous efforts were no longer useful and that a new case would have to be made. Alex stated that if they had a base case which was periodically updated, all of the time spent on previous planning efforts to get an up to date combined case would be eliminated. SDG&E and SCE stated that this could save a few months of work and there may be some benefit to it.

Tom Field stated that the SWAT SCWG had found that even in this effort, there is a problem because they had used the DPV2 case initially to get some of the conversion problems fixed in the programs. Tom stated that they had also found several errors in the data in this case. Tom stated that if they had had a good base case to start with that was periodically updated and error checked, the problems probably would not have been in the case. SDG&E stated that updating the cases would require a lot of resources. SDG&E stated that when a project comes in 6 months after the case and someone needs to update their case, there would have to be a lot of resources spent because the case would no longer be up to date. Tom stated that this would be a quick process because each utility should use the combined case as their case and update the information in it. Tom stated that when the updates are performed, each member would strip out their areas and zones and send them combine them together. Tom stated that once the first case was setup with zones, duplicate bus numbers removed, and common seams buses, combining them would take a couple of minutes with a merge. SDG&E asked if this feature was available in each of the three programs. Tom stated that SWAT would be using Aspen to do it and had not looked into merging with the other programs. SDG&E stated that this would be a problem for others that do not have Aspen when they need an update. Tom stated that the other programs probably have a similar function, but they could also send them to SDG&E to have them merge them in a couple of minutes.

SCE and SDG&E stated that they still did not see the benefits of dedicating the resources to do this work, but that may be because they were both from planning. They stated that the protection people in their companies may be more appropriate to identify the benefits. Tom suggested having the next teleconference with the protection people of SCE, SDG&E, and CFE. Everyone agreed to this next step.



2nd Teleconference Arranged for November 14

The 14th appears to be the common date that everyone is available except for Gary Chinn. Since this second teleconference will be mainly on the justification which will be more for Howard Ham than Gary, I have requested a teleconference bridge for tomorrow. I requested 1 pm to 2 pm pacific time (2 pm to 3 pm arizona time). I will send out the information this afternoon or in the morning after the teleconference bridge information is sent to me.

The main emphasis of this second teleconference is to determine whether or not the benefits of combining the SCE, SDG&E, and CFE short circuit cases justify the resources required to combine the cases.

During the first teleconference, the error in calculating breaker duties using equivalents on the boundaries was discussed as one of the benefits. Ron Onate of APS was referenced during that part of the teleconference and he has agreed to join this teleconference to provide information on his findings related to the error in breaker duty calculations using equivalents on the boundaries.

Another issue discussed in the first teleconference was the checking of the spread between fault currents in the three cases. A check of all buses that are common in the any two of the three cases as well as the IID case would be required to make this determination. The mechanics of how to do this will be discussed.

The main benefit of combining the cases is correct fault currents. To know whether or not you have correct fault currents, a comparison is required. In addition to correct fault currents, the X/R ratio required for the correct DC offset in circuit breaker calculations is required. Again, Ron will discuss this one. These are the benefits which have affects on TRV calculations, breaker ratings, relay settings, and safety grounds.



November 14, 2006

Teleconference Summary

The teleconference scheduled for today was attended by Bill Cook (SDG&E), Brad Bentley (SDG&E), Alex Fratkin (NPC/SPPC), and Tom Field (WAPA). IID was unable to participate due to the WECC meetings in Las Vegas today. CFE probably had the same conflict. We were unable to reach Howard with SCE. Ron with APS called after the participants decided to reschedule the teleconference.

Since only one of the stakeholders was present, the participants decided to reschedule the teleconference after thanksgiving. Please let me know if you will be available November 27, 28, 29, 30, or December 4, 6, or 8 for a teleconference. Please let me know which of these days you will or will not be able to have a teleconference and I will try to setup another teleconference for a date that will accomodate everyone. Thanks

Update on October Meeting Action Items

- **Person:** Entire Group
- **Action Item:** Send in the areas and zones they want to use for their data.

- **Person:** Entire Group
- **Action Item:** Send in the zones they want to use for their mutual zone, their equivalent zone, and their seams zone.

- **Person:** Maria Ramirez
- **Action Item:** Call Steve C. and ask him to send in the PNM case for error checking.



PNM Case Status – January 22 email

With respect to the meeting in Tucson this week I'll not be able to attend either physically nor via teleconference (as I've made known in the past Thursdays will no longer work for me). My desire is to have the meetings on either Tuesday or Wednesdays, otherwise my support will be sporadic at meetings.

The PNM database is not yet complete as we are now having to include the TNMP system as part of our system. Some detail is still lacking and is work underway.



Update on October Meeting Action Items

- **Person:** Entire Group
- **Action Item:** Send their information to Tom F. to change the buses spreadsheet if they are an owner of a seams bus and want different information than in the WECC case.

- **Person:** Entire Group
- **Action Item:** Review their seams buses that they are the owners of in the WECC case and return any split WECC buses to Tom F. and indicate which lines are connected to them and the bus numbers they want to use for them.

- **Person:** Entire Group
- **Action Item:** Start putting area and zone information in their case in preparation for the combining of the cases.



Clarification on Areas and Zones sent to SRP on December 14

SEAMS BUSES:

These are the buses where one system connects to another system. The owner a line connecting to a bus may or may not be one of the owners of the bus. Since some buses do have multiple owners, a single owner must be defined for maintaining a single set of data. Therefore, the latest WECC PSLF operating case designation of the owner is the owner that we will use for assigning the responsibility for maintaining the bus data. Each member that has a line connecting to a seams bus will have to include the seams bus in their case. The zone number for this seams bus will be defined by the member that is assigned as the owner.

EQUIVALENTS:

Each member will be responsible for equivalents that they are the only member connected to. This will include equivalents outside of SWAT and equivalents inside of SWAT when it is not another member's data. For instance, a large mining company has a subtransmission system in Arizona that may or may not be equivalenced out by one of the members. Most members have ties outside of SWAT which they will be responsible for providing equivalents for. When the SWAT case is combined with other regional group cases, such as CCPG, the equivalents for that regional group in the SWAT case will be replaced with the detailed representation provided by the group. The long term goal is to have groups surrounding SWAT so equivalents will no longer be needed outside of SWAT for the SWAT case.

For the small utilities completely inside your territory, you can either equivalence them or, if you have the data and want to maintain it, provide the full representation. If you want to equivalence them, you may want to use two different equivalent zones to make the distinction between equivalents within your territory and equivalents outside of SWAT.

Clarification on Areas and Zones sent to SRP on December 14

The process is to take your case, extract all of your zones and all of the seams bus zones (and mutual zones). Equivalentents are your zones. You decide which zones you want to assign to equivalentents. The equivalentents are parts of the system that are only connected to you. For the other members, their zones will not be extracted if they are not in one of your zones which includes your equivalentent zones, a seams zone, or a mutual zone.

The data for the other members will be xtracted from their cases. When the cases are merged, the other members data will be connected to the seams zones.

The equivalentents will not be deleted. For example, if you are touching part of Pacificorp in Utah, you will have an equivalentent for them at the bus that your line connects to them or at your bus that their line connects to. We have to keep those equivalentents. For internal, if you have say a small municipal that is serviced by you, then you can equivalence their system at your bus that they connect to since they will not be connected to others.

January 22 update from SRP on adding areas and zones to their case

Neither Dave nor I will be attending the meeting for January. However, here is an update of where we stand currently. We have made great progress with our Aspen case. We have updated all of the bus numbers, bus names, zones, and areas for our SRP system. Currently, we are working on our second run through of the case. We should be completely done with updating our case by the end of this week.



Update on October Meeting Action Items

- **Person:** Tom Field
- **Action Item:** Change the buses spreadsheet to include any split bus information that members send in.

- **Person:** Entire Group
- **Action Item:** Identify their seams buses and send a revised list from the spreadsheet with just seams buses and indicate the names and numbers they want changed in the spreadsheet..

- **Person:** Entire Group
- **Action Item:** Change the names and numbers of their seams buses to match the spreadsheet names and numbers for the owners of the seams buses.



Update on October Meeting Action Items

- **Person:** Tom Field
- **Action Item:** Change the buses spreadsheet to include any changes that the members send in.

- **Person:** Entire Group
- **Action Item:** Add unique bus numbers to their buses that have a bus number of 0 and send in their case for the second round of error checking to be able to determine the number of buses with a difference of 100 A or more.

- **Person:** Tom Field
- **Action Item:** Put a branches sheet for all of the buses in the buses spreadsheet.



Updated Buses Spreadsheet

SWAT SCWG Cases

(All cases are password protected)

2006 Operating Case

Updated DPV2 [Case](#) , [Aspen format](#) (version 10.7)

Area and Zone [List](#) , [Procedure](#) , [Buses](#)

APS [Case](#)

SRP [Case](#)

WAPA DSW [Case](#)

TEP/Unisource [Case](#)

SWTC [Case](#)

IID [Case](#)

EPE [Case](#)

PNM Case

NPC/SPPC [Case](#)

SWRTA [Case](#)

Lines Sheet

from bus #	bus Name	kV	to bus #	bus Name	kV	circuit	area	zone	owner
65012	106TH SO	138	65013	118TH SO	138	1	65	655	7
65012	106TH SO	138	66085	NINETY S	138	1	65	655	7
65013	118TH SO	138	65475	DUMAS	138	1	65	655	7
47317	119TH ST	115	47170	HOKINSN	115	1	40	456	49
47317	119TH ST	115	47241	SW51	115	1	40	456	49
38268	12TH ST	69	38258	8TH ST	69	1	30	323	334
47110	4TH PLN	115	47241	SW51	115	1	40	456	49
73238	4THST TP	69	73287	4TH ST	69	1	73	751	60
73238	4THST TP	69	73286	ANAMOSA	69	1	73	751	60
73238	4THST TP	69	73290	EASTNRTI	69	1	73	751	60
73238	4THST TP	69	73278	WESTBLV	69	1	73	751	60
54808	505L TAP	69	54811	521AL TP	69	21	54	560	76

[▶ ▶ \ all-owners](#) /
 [all-areas](#) /
 [all-zones](#) /
 [all-buses](#) /
 [all-transformers](#) /
 [all-lines](#) /
 [APS](#) /
 [EPE](#) /
 [IID](#) /
 [NPC](#) /
 [PNM](#) /
 [SRP](#)

Transformers Sheet

from bus #	bus Name	kV	to bus #	bus Name	kV	circuit	area	zone	owner
10004	ALCAZAR	115	10005	ALCAZAR	12.5	1	10	101	29
10006	ALIRE_T	46	10408	ALIRE	12.5	1	10	106	29
10007	ALLISON#	115	10008	ALLISON	13.8	1	10	107	29
10010	AMBROSI	115	10011	AMBROSI	230	1	10	107	29
10012	ANDERSC	115	10013	ANDERSC	12.5	1	10	101	29
10014	ARNO	46	10015	ARNO_1	12.5	1	10	101	29
10014	ARNO	46	10036	ARNO_2	12.5	1	10	101	29
10066	CLAREMN	115	10067	CLAREMN	12.5	1	10	101	29
10069	COAL	115	10070	COAL	12.5	1	10	101	29
10073	COCHITI	46	10074	COCHITI	12.5	1	10	103	29
10075	COLINAS	115	10076	COLINAS	12.5	1	10	106	29
10077	COLLGE	115	10078	COLLGE	12.5	1	10	102	29

\ all-owners / all-areas / all-zones / all-buses / **all-transformers** / all-lines / APS / EPE / IID / NPC / PNM / SRP

Update on October Meeting Action Items

- **Person:** Tom Field
- **Action Item:** Generate a list of the types of errors to be fixed and send to everyone before they send their fixed cases back.

- **Person:** Entire Group
- **Action Item:** Make a list of the errors not in their data and identify whose data the error is in.

- **Person:** David Gutierrez
- **Action Item:** look at the COX transformers and remove one of them if it is not there.



Update on October Meeting Action Items

- **Person:** SRP
- **Action Item:** Fix the problems in the SRP case identified and send the fixed case back to Tom F. for a second round of error checking.

- **Person:** WAPA
- **Action Item:** Fix the problems in the WAPA case identified and send the fixed case back to Tom F. for a second round of error checking.

- **Person:** Ron Onate
- **Action Item:** Fix the problems identified in the APS case and send the fixed case back to Tom F. for a second round of error checking.



Update on October Meeting Action Items

- **Person:** Ron Onate
- **Action Item:** Fix the bus names and kVs that are duplicates in the APS Cape case.

- **Person:** Ron Onate
- **Action Item:** look further into why 1 of the switches was not added in the APS log file and contact Electrocon if the report is incorrect.

- **Person:** Tom Field
- **Action Item:** send the correct generator data to TEP.



Update on October Meeting Action Items

- **Person:** Ron Onate
- **Action Item:** develop a list of what characters are not accepted in Cape.

- **Person:** Tom Field
- **Action Item:** send list of characters not accepted in CAPE to the group.



List of Characters Accepted by Cape

From: Thomas Field

11/09/06 2:54 PM

Subject: SWAT SCWG: October Meeting Minutes and Cape Characters

APS received a response from Electrocon on the characters allowed in Cape. The response is shown below:

The valid characters are A-Z, a-z, 0-9 and the underscore. All other characters are replaced by the underscore. Also, the first character must be A-Z or a-z.



Update on October Meeting Action Items

- **Person:** Ron Onate and Tom Field
- **Action Item:** Check the IID case and put it on the website.

- **Person:** Ron Onate and Tom Field
- **Action Item:** Have a teleconference with Aspen and Electrocon to try and get them to form an agreement to share information needed for data conversion between the two programs.



Electrocon Email – November 8

My main reason for my writing now is to change gears on you just a bit. In our last phone conversation you asked us to send Sherman the description of the EII network data format and I said we needed to update the documentation for it. The more I thought about it, the more I could see that use of the EII format is the wrong direction to take. I now propose that we use the PSS/E format instead as a conduit for network data transfer. There are several good reasons:

1. The EII format is obsolete today. I don't want to incur the cost of maintaining it when it isn't needed. We use it for quick testing sometimes and one customer uses it in a legacy application, but we don't maintain the export function for that format.
2. For years we have focused our energies on supporting the reading and writing of network data in PSS/E format. At present, we support PSS/E versions 23 through 30. Customer demand ensures that we will continue to support this format. The bottom line is there will be no additional cost to us if you and Ron would use it.
3. I know that Aspen converts from PSS/E to OneLiner, and I assume that OneLiner can export data in PSS/E format too. This question and the question of PSS/E version support would be good fodder for the conference call. If Aspen does support PSS/E export, then their incremental cost would be minimal too.
4. PSS/E is widely accepted and is the third format used by your member companies.

Aspen Email – November 8

ASPEN OneLiner has conversion programs for PSS/E data V23 through V30. OneLiner can also export network data in PSS/E format (v23 through v30).

I am in general agreement with Paul about using PSS/E format as the common format for data transfer. Most reliability councils are already doing this for their power flow data. However, I want to caution that certain network elements, such as MOV-protected series capacitors and zigzag transformers, are not supported by PSS/E. I am certain Paul can think of similar difficulties.



Electrocon Email – November 15

Jeff, Ashok, and Donald here agree with the decision to add special comment lines to the .raw and .seq PSS/E files to accommodate any data model differences. I can think of only one at the moment: MOVs and spark gaps. So, don't worry, this will work. (We'll "make" it work.)



Update on October Meeting Action Items

- **Person:** Ron Onate and Tom Field
- **Action Item:** Rerun the cases after Electrocon fixes the DD transformer conversion problem.

- **Person:** Ron Onate and Tom Field
- **Action Item:** Look into the “secondary voltage difference more than 20” problem in the NPC case and determine what the message means and what the problem is.

- **Person:** Ron Onate
- **Action Item:** Look at the 19 transformers with duplicate ckt, 19 neutral buses added, and 19 bus ties added in the SRP case to determine if they were the same.



Update on October Meeting Action Items

- **Person:** Ron Onate and Tom Field
- **Action Item:** Look into the cause of the “mutual couplings ignored because bus not found” warning message in the TEP case.

- **Person:** Ron Onate and Tom Field
- **Action Item:** Look into the cause of the “end buses were not found on bus ties” warning message in the TEP case.



Update on October Meeting Action Items

- **Person:** Ron Onate and Tom Field
- **Action Item:** Look at what changed during the conversion process for the APS case to give the differences between the pre and post cases.

- **Person:** Ron Onate and Tom Field
- **Action Item:** Rerun the SRP faults after the meeting and look at the differences if they are the same to find out why there were differences between Aspen and Cape.

- **Person:** Ron Onate and Tom Field
- **Action Item:** Look at the differences in the Cape and post results for the WAPA case to find out what the differences are due to.



Update on October Meeting

Action Items

- **Person:** Ron Onate and Tom Field
- **Action Item:** perform a second round of error checking on the TEP case and generate the comparison spreadsheet.

- **Person:** Ron Onate
- **Action Item:** Discuss a plan for the equivalents checking work with Steve after the meeting. Call Steve to setup a timeline and teleconference for developing the plan.

- **Person:** Tom Field
- **Action Item:** send out the agenda for the next meeting with the directions and information provided by Tom S.



Additional Action Items

- Any other action Items not in draft Minutes?



New Items

- Advanced ASPEN OneLiner Training Class– March 21-22, 2007 in San Francisco

For the first time, we are offering an Advanced Training Class for experienced users of ASPEN OneLiner. In this class we will give an in-depth look at various topics, including modeling of 3-winding transformers and mutual coupling, relay test files for end-to-end testing, simultaneous faults, network equivalence, network anomalies checking, relay coordination checking, file-merge command, advanced applications of the Case Comparison Program, and PowerScript programming. The 2-day class comprises of lectures and hands-on exercises.

The training schedule and a link to the on-line signup form are available at http://www.aspeninc.com/site_news.htm



IEEE PSRC Meeting – January 8-11, 2007 in Scottsdale, AZ

Information on the
Phoenix, AZ Meeting
January 8th - 11th 2007

Secretary - Bob Pettigrew

The Power System Relaying Committee (PSRC) last met in Phoenix, AZ on January 8 - 12, 2007. You can download/view the agenda for the meeting, the latest Working group status matrix or the meeting notice by clicking on one of the buttons below. You can save the PDF files by right clicking on the download button and select "save target as".

Agenda for Meeting - January 2007

Down-Load File

Final

Latest Working Group Status Report

Down-Load File

Sept 2006

Meeting Notice - January 2007

Down-Load File

1st

[Phoenix/Scottsdale Links](#)

SWAT Update

- Next SWAT Meeting on January 30, 2007
- Phoenix, AZ



Membership Inquiry – December 14, 2006

The SWAT SCWG is open to all SWAT members that are WECC members. If a SWAT member requests membership in the SWAT SCWG, their request is passed along to SWAT for approval. After approval from SWAT, the SWAT SCWG approves the request. If you need any additional information, please let me know.

Tom Field
Electrical Engineer
Transmission Planning
Western Area Power Administration
Desert Southwest Region
voice: (602) 605-2517
fax: (602) 605-2464
email: FIELD@WAPA.GOV

>>> Abbas Abed <AAbed@NavigantConsulting.com> 12/13/06 5:47 PM >>>

I was wondering if you could please give me some information about joining the SWAT SCWG.

Thanks



Alberta Inquiry about Status

Tom:

It is nice to receive reply from you. Thanks for the update. I will go over them and might get back to you after I had a chance to review the progress.

If I recall that your committee has decided to forward the results to AESO. May I be Cced on it.

Regards

Ramaiah

-----Original Message-----

From: Thomas Field [<mailto:Field@wapa.gov>]

Sent: Tuesday, October 31, 2006 12:04 PM

To: Ramaiah Divi

Subject: RE: Comparison of Short circuit Models - enquiry

Hi Ramiah,

We are still working on the case. We have been error checking our cases with Cape and have identified a few modifications to Cape. The latest modification was made a couple of weeks ago. We are nearly finished with this phase of the project. All of the members are conditioning their cases now in preparation for the combining. We will start on the combining work in January.

All of the minutes of the meeting are on the website.

Other New Items

- Any other new items not on the agenda since the last meeting?



PTI to Aspen Conversions

- No work done since last meeting



Check of Members Cases

- IID case checked
- NPC case had 3rd round of error checking
- EPE and TEP cases had 2nd round of error checking
- PNM is the only case that has not been submitted
- SRP, APS, and WAPA cases checked again after changes to CAPE



Error Checking Work

- Tom F. and Ron O. met on November 2, 2006 for a full day and ran the IID, TEP, and NPC
- Tom F. and Ron O. met on November 15, 2006 for a full day
- Tom F. and Ron O. met on January 17, 2007 for a full day



November 2, 2006 meeting

- IID, TEP, NPC, WAPA, APS, and SRP cases rerun and files generated
- Action items addressed
- Output files analysis for previous problems performed on NPC



November 15, 2006 meeting

- Teleconference held with Aspen and Electrocon for future updates to conversion routines
- Output files analysis for previous problems performed on TEP
- Previous problem action items investigated
- New problems found
- Decided to wait for further program modifications before rerunning all the files



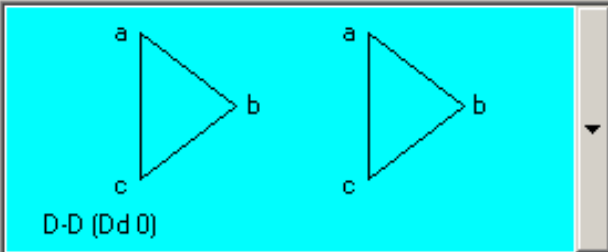
Action Items Resolutions – DD transformer in EPE pre and post cases

2-Winding Transformer Data

731 RGD GEN6 13.8kV - 730 rgd 4160 4.16kV

Name= Ckt ID= MVA1= MVA2= MVA3=

MVA base for per-unit quantities=



D-D (Dd 0)

R= X=

B=

Ro= Xo=

Bo=

RGD GEN6 13.8 kV

Tap kV=

rgd 4160 4.16 kV

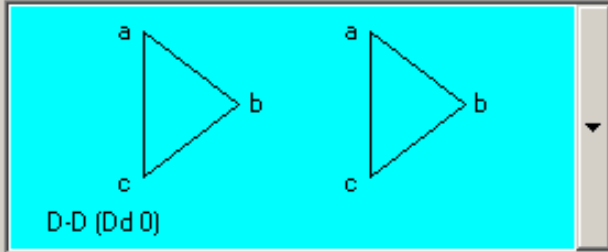
Tap kV=

2-Winding Transformer Data

731 RGD GEN6 13.8kV - 730 rgd 4160 4.16kV

Name= Ckt ID= MVA1= MVA2= MVA3=

MVA base for per-unit quantities=



D-D (Dd 0)

R= X=

B=

Ro= Xo=

Bo=

RGD GEN6 13.8 kV

Tap kV=

rgd 4160 4.16 kV

Tap kV=

Action Items Resolutions – Duplicate ckt for lines and transformers in NPC case

```
duplicate line/xfmr ckt at 392 1  
line 392 is in area 6  
xfmr 1 is in area 6  
common = 2  
wdg1 = 280 272 0  
wdg2 = 280 272 0
```

- The winding numbers are the actual bus numbers to use to look for problems

Action Items resolved

- look further into 1 of the switches was not added in the APS log file and contact Electrocon if the report is incorrect.
- Problem found to be two switches in parallel – Cape doesn't allow and removes one



Response from Electrocon on bus ties on November 1, 2006

Ron,

In CAPE, the switches are modeled as bus ties and parallel bus ties are not allowed. That is why the second instance was not added. Was this Aspen case exported from a CAPE database or did it come from an Aspen user? Are there really two switches in parallel?

Jeff

At 10:07 AM 10/30/2006 -0700, you wrote:

When we converted an Aspen database back to Cape the following was generated in the log. On the 11th line it says that Switch 8 306 has been added. Then on line 17 it says it was not added because it already exists. Then on line 21 it says that 289 out of 290 switches have been added. It sounds like one switch has been left out. Why does Cape do this?

I don't like to bother you with these details but the SWAT SCWG wants to make sure that the conversions go smoothly when we are converting from Cape to Aspen and back.

Action Items resolved

- Look into the cause of the “mutual couplings ignored because bus not found” warning message in the TEP case.
- One of the lines was offline causing the message



Action Items resolved

- Look at the 19 transformers with duplicate ckt, 19 neutral buses added, and 19 bus ties added in the SRP case to determine if they were the same.
- Found to be just a coincidence in the numbers



Action Items resolved

- Look into the “secondary voltage difference more than 20” problem in the NPC case and determine what the message means and what the problem is.
- Problem no longer reported in the revised NPC case with the revised CAPE program



Action Items Unresolved

- Look into the cause of the “end buses were not found on bus ties” warning message in the TEP case.
- Problem found to be buses with more than one switch attached – Cape removes the switches



End Buses Not Found Problem

```
Warning: End buses not found; bus tie ignored  
Bus tie between 893 and 898
```

- Problem due to more than 1 switch connected to a bus
- Cape removes the switches
- Problem still not resolved
- Cape no longer puts out warning message in the latest version, but the problem is still there

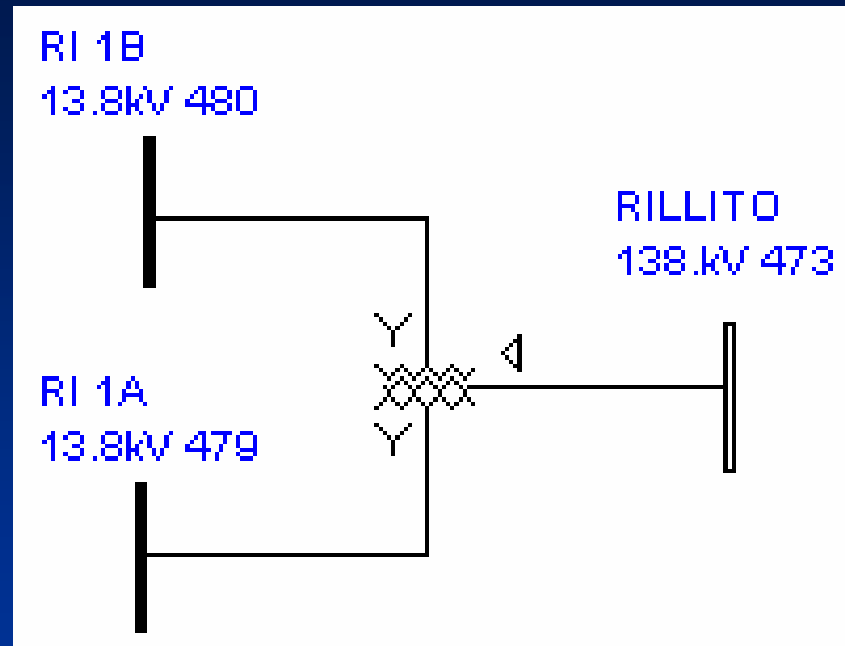


Problems found on November 15

Paul Since I am getting ready to leave and I want to make sure that the transformer issue that you are solving is the YYD converted to a DYY problem.

The other new issue is the elimination of a bus tie and a bus turned off when converted from Aspen to Cape. I have attached an Aspen file which does this on bus LL 69B2 and we lose the bus tie LL 69B3 and LL 69B3 is put "offline".

YYD Transformer Problem – TEP case



teppostric.rep - Notepad

File Edit Format View Help

Importing Text Data File

error_readTX_06: (2479) illegal winding conf. in use for this transformer:

'RILLITO' 138 'RI 1A' 13.8 'RI 1B' 13.8 '1'= 1 0 'RI T1' 138 13.8 13.8 0 0.02166

YYD Transformer Problem – TEP pre case

3-Winding Transformer Data

Name= **RI T1**

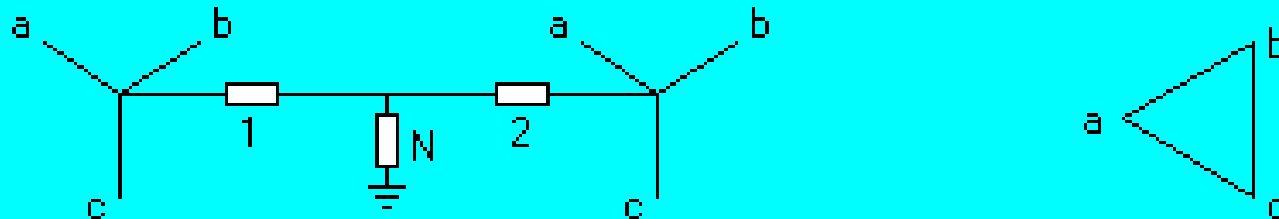
ID= **1**

MVA Ratings = **0.**

0.

0.

Y-Y-D, Delta leads



RI 1A 13.8 kV

Tap kV= **13.8**

RI 1B 13.8 kV

Tap kV= **13.8**

RILLITO 138. kV

Tap kV= **138.**

MVA base for per-unit quantities = **100.**

Change

Fict. bus No for data export = **0**

Positive-sequence short circuit impedances (pu)

$Z_{ps} = 0.03743 + j 0.84784$

$Z_{pt} = 0.02166 + j 0.44681$

$Z_{st} = 0.02222 + j 0.45012$

YYD Transformer Problem – TEP post case

3-Winding Transformer Data

RILLITO 138. kV - RI 1A 13.8 kV - RI 1B 13.8 kV

Ckt ID= Auto Name= B= B0=

Zps= +j Zpt= +j Zst= +j

Zps0= +j Zpt0= +j Zst0= +j

MVA1= MVA2= MVA3=

RILLITO 138. kV

Bus 1 tap kV=

use: G D

test: G

RI 1A 13.8 kV

Bus 2 tap kV=

use: G D E

test: G D O

RI 1B 13.8 kV

Tert. tap kV=

use: G D E

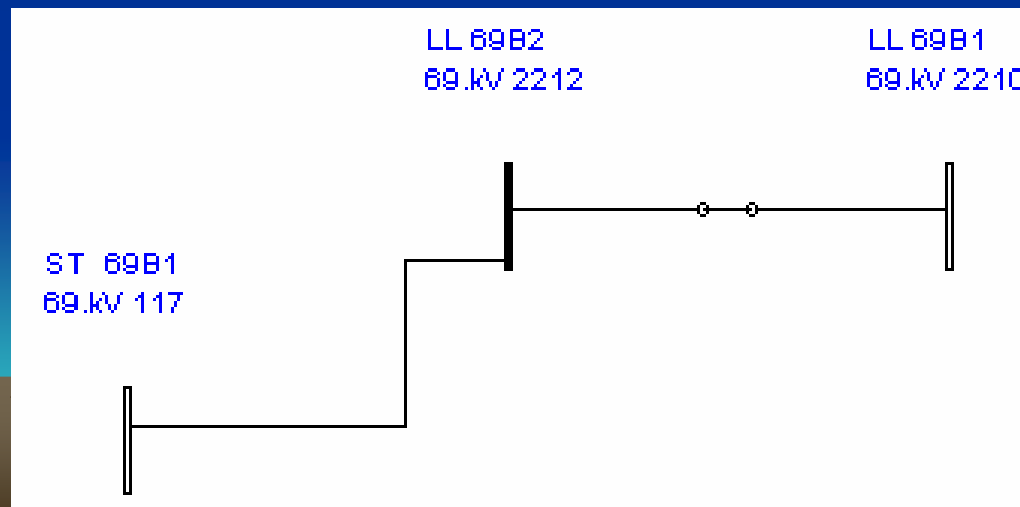
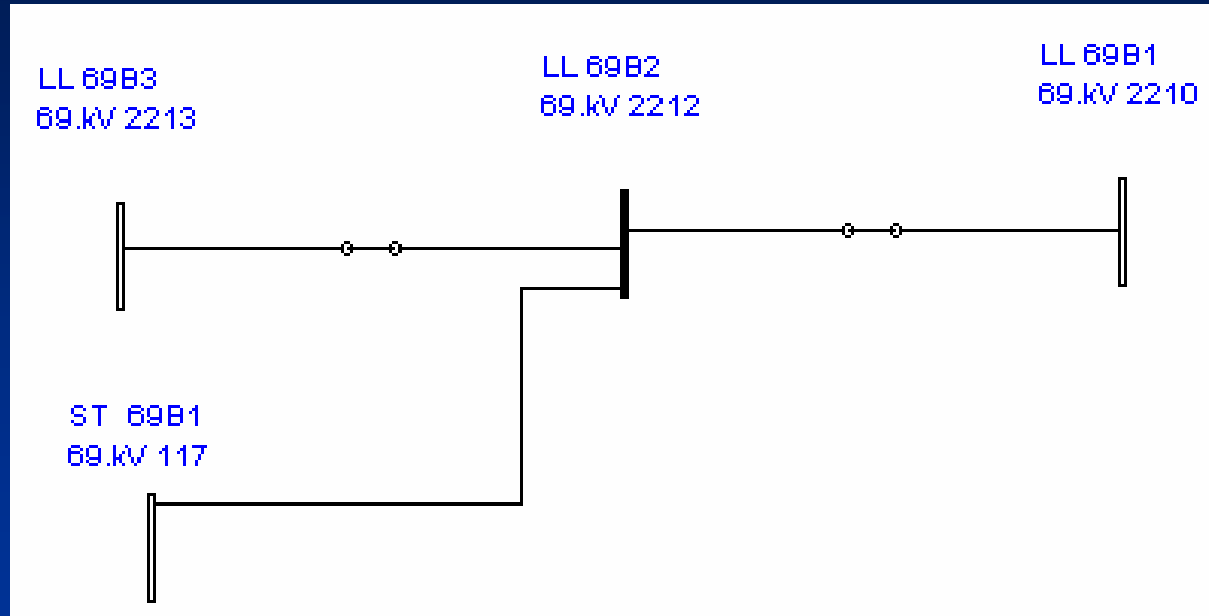
test: G D O

YYD Response from Electrocon – December 4 and January 21 emails

We duplicated each others tests because Don has been revising our Aspen import/export code over the past two weeks, not only to correct the YYD vs. DYY problem but also to look for other places where conversion errors could occur. He worked with the latest version of the code and I worked with the released version.

1. Yes, the problem with our interchanging the order of transformer winding data was corrected.

Elimination of Switch Problem – APS pre and post cases



Multiple Bus Tie Response from Electrocon – January 21 email

2. We never found or recreated the problem you and Ron had described with network components being placed off-line. In my email of December 1, item #4, I explained the tests Don and I did and that we found no errors. I asked for more details about the steps you had done that caused errors.



Response from Electrocon after November 15 meeting and on January 21

I checked with Donald just now. We'll have the corrected CAPE-to-OneLiner export update to you within ten days (and probably several days sooner). He took this opportunity to review many other areas of possible trouble and has or is fixing them. That's why we have appeared to be slow.

3. Don found other potential problems with Aspen data conversion made changes to our iAspentodb.exe program (dated December 6, 2006), and they are part of the December 8 release. Don knows of other data error detections that he plans to enforce, but those involve only real power flow|controlling transformers. They affect only power flow calculations, not short circuit.

January 17, 2007 meeting

- New revisions to software installed
- TEP, NPC, IID, WAPA, SRP, and APS cases rerun
- Comparisons to outputs made
- YYD and Bus Tie problems still unresolved



Changes in new software

- Improvement in singularity checking – zero sequence data now correct in report
- New error message in NPC case

```
Isolated branches/transformers are coupled  
*** Error: unable to treat connected isolated groups at buses      324 CO      325 CO  
Suggested correction: look for an ungrounded neutral node at the error bus and add a dummy 9999-ohm shunt
```

- Number of transformer windings different before and after changes to software – EPE had 191, but now the number reported is 187 – TEP had 451, but now has 450 - same case used, but reported numbers are different – may be report itself



Comparison Spreadsheets

- IID did not have any differences of more than 2 A on any comparisons
- TEP had too many buses without a number, so only post to cape comparisons useful
- SRP and APS cases still have problems



EPE Pre to Post Comparison

- 7 buses with 100 A or more difference
- First 2 are same, but Cape renumbered it

1	dif	3phs dif.	slf dif	max dif	bus name
2	dif	-35237	0	35237	0
3	dif	35237	0	35237	WESTMESA T3
4	same	7968	0	7968	DARBYSHIRE
5	same	0	-3988	3988	VAIL
6	same	0	-2517	2517	VAILCAP20%
7	same	0	-1155	1155	VAILCAP28.4%
8	same	0	-872	872	VAIL2
9	same	0	-591	591	GREENLEETAP
10	same	0	-490	490	GREECAP17.9%
11	same	0	-50	50	VAIL1

EPE Pre to Cape Comparison

- 56 buses with 100 A or more difference

1	dif	3phs dif.	slf dif	max dif	bus name
6	same	3	3992	3992	VAIL
7	same	3834	3564	3834	P DODGE
8	same	2	2521	2521	VAILCAP20%
9	same	20	1175	1175	VAILCAP28.4%
10	same	-1138	-649	1138	P DODGE
11	same	-1080	-736	1080	ASCARATE
12	same	-1075	-733	1075	69KV CAPBANK
13	same	2	873	873	VAIL2
14	same	-611	-259	611	VISCOUNT
15	same	1	593	593	GREENLEETAP
16	same	-547	-249	547	AUSTIN
17	same	543	458	543	HAT T1
18	same	1	492	492	GREECAP17.9%
19	same	-433	-246	433	SCOTSDALE
20	same	-425	-177	425	FARAH
21	same	-421	-242	421	ASCARATE
22	same	-392	-210	392	CHEVRON
23	same	-356	-176	356	DYER
24	same	-354	-173	354	EP REF
25	same	-344	-165	344	AUSTIN
26	same	-338	-194	338	COPPER
27	same	-288	-229	288	RIO GDE 115
28	same	-285	-263	285	RGD GEN8
29	same	-273	-254	273	NEWMAN
30	same	-257	-147	257	LANE

EPE Cape to Post Comparison

- 50 buses with 100 A or more difference

1	dif	3phs dif.	slf dif	max dif	bus name
2	same	3834	3564	3834	P DODGE
3	same	-1139	-649	1139	P DODGE
4	same	-1081	-737	1081	ASCARATE
5	same	-1076	-733	1076	69KV CAPBANK
6	same	865	0	865	DARBYSHIRE
7	same	-612	-260	612	VISCOUNT
8	same	-548	-249	548	AUSTIN
9	same	543	458	543	HAT T1
10	same	-434	-247	434	SCOTSDALE
11	same	-425	-177	425	FARAH
12	same	-422	-243	422	ASCARATE
13	same	-393	-210	393	CHEVRON
14	same	-356	-176	356	DYER
15	same	-355	-174	355	EP REF
16	same	-345	-166	345	AUSTIN
17	same	-339	-194	339	COPPER
18	same	-289	-230	289	RIO GDE 115
19	same	-287	-264	287	RGD GEN8
20	same	-277	-257	277	NEWMAN
21	same	-258	-147	258	LANE

NPC Pre to Post Comparison

- 18 buses with 100 A or more difference

1	dif	3phs dif.	slf dif	max dif	bus name
2	dif	27177	81	27177	BUS1
3	dif	-14319	-6718	14319	BMI-T
4	dif	-7297	13348	13348	BRN
5	dif	-5601	-6632	6632	BMI-T2
6	same	-673	2093	2093	NCA 1 G3
7	same	-675	2093	2093	NCA 1 G4
8	same	-675	2082	2082	NCA 1 G1
9	same	-674	2082	2082	NCA 1 G2
10	dif	764	579	764	BUNKER OPD
11	dif	-764	-579	764	BMI/CL/LV-1
12	same	-16	-365	365	MHT
13	same	-242	-242	242	rg-3-su
14	same	-242	-242	242	rgdum
15	same	-13	-225	225	ED
16	same	-72	199	199	RG G3
17	same	-73	199	199	RG G3A
18	same	-68	183	183	LVC GS
19	same	-68	183	183	LVC GT
20	same	14	-180	180	NSO
21	same	-132	-114	132	DUMMY SP MUT
22	same	-116	-122	122	HOOVER N1N2
23	same	-116	-122	122	HOOVER N3N4
24	same	-116	-122	122	HON1N2&N3N4
25	dif	111	111	111	VEN-1
26	dif	111	111	111	VEN-2
27	dif	111	111	111	VEN-B1
28	dif	111	111	111	VEN-B2
29	same	-20	-104	104	MC

NPC Pre to Cape Comparison

- 79 buses with 100 A or more difference

1	dif	3phs dif.	slf dif	max dif	bus name
2	dif	-27177	-81	27177	BUS1
3	dif	26448	-579	26448	BUNKER OPD
4	dif	19925	13353	19925	BMI/CL/LV-1
5	dif	-19144	-12768	19144	BRN
6	same	49	6531	6531	WW-N
7	same	47	6530	6530	WW-S
8	same	47	6465	6465	DUMMY WW
9	same	675	-2093	2093	NCA 1 G3
10	same	675	-2093	2093	NCA 1 G4
11	same	676	-2082	2082	NCA 1 G1
12	same	676	-2082	2082	NCA 1 G2
13	same	27	-621	621	WW
14	same	16	594	594	SR 2
15	same	16	578	578	SR 1
16	same	13	564	564	SW-T2
17	same	12	493	493	SLS
18	same	22	-456	456	DUMMY-KD
19	same	13	444	444	SA-T1
20	same	11	415	415	PP-6 TAP
21	same	21	-377	377	SR
22	same	145	375	375	MHT
23	same	10	312	312	DEB
24	same	312	83	312	NW-TEST
25	same	214	306	306	RG G1 ES BUS
26	same	214	306	306	rg-dumm
27	same	18	-304	304	SUNPEAK5
28	same	18	-304	304	SUNPEAK4
29	same	18	-304	304	SUNPEAK 3

NPC Cape to Post Comparison

- 36 buses with 100 A or more difference

1	dif	3phs dif.	slf dif	max dif	bus name
2	dif	27212	0	27212	
3	dif	-26441	580	26441	BUS1
4	dif	19161	12775	19161	BUNKER OPD
5	dif	-14322	-6720	14322	BMI-T2
6	dif	-5595	-6629	6629	BRN
7	same	20	6510	6510	WWW-N
8	same	19	6509	6509	WWW-S
9	same	18	6444	6444	DUMMY WWW
10	same	11	-630	630	WWW
11	same	7	589	589	SR 2
12	same	6	573	573	SR 1
13	same	5	555	555	SW-T2
14	same	5	491	491	SLS
15	same	9	-463	463	DUMMY-KD
16	same	5	442	442	SA-T1
17	same	5	413	413	PP-6 TAP
18	same	8	-385	385	SR
19	same	226	323	323	RG G1 ES BUS
20	same	4	311	311	DEB
21	same	7	-310	310	SUNPEAK5
22	same	9	-309	309	SUNPEAK 3
23	same	9	-309	309	SUNPEAK4

TEP Cape to Post Comparison

- 12 buses with 100 A or more difference

1	dif	3phs dif.	slf dif	max dif	bus name
2	same	#VALUE!	#VALUE!	#VALUE!	TX MP 1
3	same	#VALUE!	#VALUE!	#VALUE!	TX MP 8
4	same	174	#VALUE!	#VALUE!	TX MP 20
5	same	174	#VALUE!	#VALUE!	TX MP 21
6	same	#VALUE!	#VALUE!	#VALUE!	APS-PP TX EQ
7	same	132	#VALUE!	#VALUE!	TX MP 26
8	same	#VALUE!	#VALUE!	#VALUE!	MCC MP3
9	same	#VALUE!	#VALUE!	#VALUE!	NAVAPACHE
10	same	1	43673	43673	CYPRUS 72
11	same	0	43348	43348	MISSION
12	same	1	33210	33210	SECT 2B
13	same	1	32833	32833	SECT 3A
14	same	999	721	999	RI 1A
15	same	986	712	986	RI 1B
16	same	180	126	180	KYRENE MP
17	same	133	100	133	TX MP 10
18	same	25	120	120	TX MP 29
19	same	25	112	112	TX MP 28
20	same	105	71	105	ARROYO PNM
21	same	104	75	104	TX MP 27

WAPA Case Comparisons

- Pre to Post comparisons reduced from 22 to 16 buses with 100 A or more difference
- Pre to Cape comparisons increased from 25 to 38 buses with 100 A or more difference
- Cape to Post comparisons reduced from 133 to 22 buses with 100 A or more difference
- Previously, the Cape to Post comparison was high and investigated – problem appears to be removed



SRP Case Comparisons

- Pre to Post comparisons reduced from 12 to 11 buses with 100 A or more difference
- Pre to Cape comparisons increased from 134 to 159 buses with 100 A or more difference
- Cape to Post comparisons increased from 123 to 149 buses with 100 A or more difference
- Previously, the Cape to Post and Cape to Pre comparison was high and investigated – problem has not been removed by changes in program and use of small switch reactance



APS Case Comparisons

- Pre to Post comparisons remained at 313 buses with 100 A or more difference
- Pre to Cape comparisons remained at 317 buses with 100 A or more difference
- Cape to Post comparisons remained at 57 buses with 100 A or more difference
- Previously, the Pre to Post and Cape to Pre comparison was high and investigated – problem has not been removed by changes in program and use of small switch reactance



Next Steps

- New version of Cape requested on January 23

Paul could I have a CD with the upgrades? The one and only time I downloaded on the internet gave me a problem with the startup script for CAPE.

- Known problem with Switch removal to be resolved before running again
- Cases to be looked at after rerun and recomparison to determine cause of any additional problems



WestConnect Map Proposal

- No new information yet
- January 18, Las Vegas – last meeting
- February 15, Phoenix – next meeting



Areas and Zones in Cases

- Only 1 response on mutuals, equivalents, and seams zones
- Only 1 response on seams buses
- Only 1 response on bus number differences from WECC
- No responses on split bus information



Areas and Zones

Areas and Zones from April 20, 2006 WECC case 07hw1a.sav

SWAT SCWG Member	Owner	Area	Zones	Specific Use Zones		
				Equiv.	Mutual	Seams
APS	2	14	141-147, 31,840-847			
SWTC	3	14	170 - 179			
WAPA	4	14	191-199	199	198	197
IID	16	21	210			
NPC	17, 18, 19, 20, 21, 22, 23, 24	18	181-188			
NPC (SPPC)	59	64	640-642, 644-648			
TEP	79	14	160, 164			
TEP (UES)	150	14	161-163			
SRP	80	14	150-159			
PNM (PN2)	129	10	101-107, 109, 130-132			
PNM (PN1)	130	10	100			
EPE	125	11	110			
Other New Mexico Entities:						
LAC	126	10	133			
PGT	127	10	120-123			
US	128	10	135			
NTU	131	10	108			
SPS	132	10	134, 116			
Other EPE Entities:						
CFE Mexico	111	11	117			
Other Nevada Entities:						
Valley Electric Association	25	18	189			

SRP Seams bus Information

Seams Bus Y/N	WECC Bus #	SRP Bus #	bus Name	kV	area	zone	owner	Notes
N	15132		83.5E3NT	115	14	159	80	
N	15133		83.9E3NT	115	14	159	80	
N	15601		AF-NORTH	69	14	150	80	
Y	15602	949	AF-STEAM	69	14	150	80	No Longer Used
N	15901		AGUAFR 1	13.8	14	150	80	
N	15902		AGUAFR 2	13.8	14	150	80	
N	15903		AGUAFR 3	18	14	150	80	
N	15904		AGUAFR 4	13.8	14	150	80	
N	15905		AGUAFR 5	13.8	14	150	80	
N	15906		AGUAFR 6	13.8	14	150	80	
N	15907		AGUAFR56	100	14	150	80	
Y	15201	606	AGUA FRIA230	230	14	150	80	
Y	15202	605	ALEXANDER230	230	14	150	80	
N	15606		ALEXANDR	69	14	150	80	
N	15203		ANDERSON	230	14	153	80	
N	15607		ANDERSRS	69	14	153	80	
N	15145		ARL-CT1	18	14	158	80	Not Ours
N	15146		ARL-CT2	18	14	158	80	Not Ours
N	15092		ARLINTON	500	14	158	80	Not Ours
N	15147		ARL-ST1	18	14	158	80	Not Ours
N	15101		ASARCOSR	115	14	159	80	
N	15102		ASARCOTP	115	14	159	80	
N	15182		BLKMTNAZ	115	14	157	80	CAP?

Equivalents

- Any updates?



SWAT SCWG Task Force for East Nevada Short Circuit Study Group

- SPPC/NPC declined to chair task force and suggested Tom Field chair it
- Next meeting date not known



Case Combination

- Aspen and CAPE can combine cases
- Electrocon suggested use of their program
- Both methods need to be evaluated



Electrocon Email – November 15, 2006

Regarding the eventual merge of your networks, I heard Tom say you were planning to use Aspen to merge the data. I may have misunderstood you, but I was sure biting my tongue because CAPE is the perfect tool for this. You are already dealing with assigning buses in the various networks to consistent zones. I think you said you were also getting agreement on unique bus number assignments. If you do that, you have just made it a very straightforward matter to apply the CAPE DBE tools for automating the merges just as you said you wanted to. I sent you a UGM2006 handout last June prior to that meeting. I have attached it again. It's just the tool you need. You already own it, Ron, because you have our SC Reduction module. "The price is right." Let us teach you how to use it.



Case Combination Checking

- Need a volunteer to check Aspen method
- Same case should be used on Aspen and CAPE
- 3 sets of zones in one small case to test



Benchmark Case for Testing

- Extract 2 of the 3 zones into case 1
- Extract 2 of the 3 zones in case 2 using one of the zones not extracted in case 1
- Combine cases 1 and 2 using the zone that is common to both as the seams zone
- Identify problems in the combination



Determine Location of Next Meeting

- Workload will not allow WAPA to participate in meeting until end of March
- Tuesday, March 27 or Wednesday, March 28?



Next Meeting Location and Date

- Another member could run meeting in February
- 3rd Thursday conflicts with Phoenix IEEE PES
- Steve C. requires Tuesday or Wednesday
- Date?
- Time?
- Location?



Website address

- <http://www.oatioasis.com/WALC/WALCdocs/page1.htm>

