

Distribution Factor Task Force

August 25–26, 1997
San Francisco Hilton
San Francisco, California

Meeting Minutes

Attendance

Ben Li, Chairman	Canada	Roberto Paliza	MAIN
Mat Long, Vice Chairman	SERC	Larry E. Brusseau	MAPP
Jon Riley	ECAR	Chi Tang	NPCC
Tom Vitez	ECAR	Bill Tiller	SERC
Greg Krajnik	MAAC	Conrado Caunan	NERC
Patrick Shanahan	MAIN	Brian M. Nolan	NERC

Administrative Matters

The Distribution Factor Task Force (DFTF) meeting was called to order at 1 p.m. on August 25, 1997 by Chairman Ben Li. Each representative introduced himself.

Updates on SCS, iIDC, iTIS and SPSSTF activities

At the Security Coordinators Subcommittee (SCS) meeting the SCS discussed the dry run results of the Interconnection Distribution Calculator (IDC). Some of the Power Transfer Distribution Factors (PTDF's) were not correct. One reason for the discrepancies was the phase angle regulators, which has since been corrected. The other reason was that the server was, selecting the wrong data. Standardizing the NERC control area names will solve many of these problems, software manipulation should take care of the remaining problems. During the trial run, a simulation of a 400 MW reduction could not be achieved by curtailing known, non-firm transactions which impose a 5% effect on the constrained flowgates. There was discussion on reducing the threshold to a 3% effect on flowgates. Some Regions may have more up-to-date information than that provided by the interim Interconnection Distribution Calculator (iIDC). The question was raised, whether or not these Regions should use the more up-to-date information instead of the NERC data.

iIDC was initially proposed to implement the NERC line loading relief procedures. It was not designed to be continuously modified to become the ultimate IDC. The industry needs to recognize the iIDC's limitations.

Suggestions by some to reduce the curtailment PTDF threshold to 3% should proceed cautiously since there are still a large number of transactions which are not entered into the iIDC. Some purchasing and selling entities (PSE) are not entering their transactions; and some PSEs and transmission providers (TP) are still not registered with NERC. With only a limited amount of the information needed, it is difficult to make any decision. Chairman Li urged the Working Group to review the next two trial runs before making any decisions. Chairman Li also urged DFTF to make the PTDFs as accurate as possible, to minimize the source of errors and avoid the scrutiny that can be placed on the numbers. Currently some groups may be reluctant to use the information that is on iIDC due to the problems associated with them.

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Some of the flowgates in iIDC may need to be redefined. SCS is the group that should be redefining the flowgates. SCS will likely ask iIDC to do the redefining.

At the Security Process Support Systems Task Force (SPSSTF) meeting, they discussed how a flowgate should be defined for reliability reasons.

Given the concurrence by the iIDCTF to hold off weekly matrix updating until the IDC is in better shape, should the DFTF begin the updating process? DFTF concluded that two trial runs would be conducted to gain proficiency in the weekly updating process. To fully support the weekly process, there will need to be more support from the users of the system.

DFTF will begin practicing the data collection and updating process. The scaling of load and generation, without solving ac load flow to reflect the system changes, may be the only viable process to support a weekly update. Chi Tang believes that the Power Technologies Inc. MUST program would be a better application than TLTG for doing the updating. With looking at just transmission outages many Regions would be able to support the updating effort. Currently MAPP is gathering the transmission information manually. SERC will make the attempt but logistics will be difficult. ECAR will try, but its not sure how much of the data it will be able to collect by the weekly deadline. The information is needed by Thursday noon. Prior to the trial runs there will need to be some sensitivity analysis on the generation shifts.

Most of the time when a transaction is curtailed, the generation dispatch will be adjusted instead of the load. If the generation that will not be participating in the scaling is adjusted separately, then a load-to-load adjustment can be used with good accuracy. Alternately, scaling only that generation, which will participate in area to area transactions (hence TLR), would be a step towards more accurate PTDF values. To get the more defensible PTDF values some more data and work may be needed.

Is scaling of some generation separately an acceptable practice? Philosophically it is correct to not scale some of the generation. DFTF has the following options, with the numbers of supporting votes:

- | | |
|--|---|
| 1. Do nothing | 1 |
| 2. Incorporate major generation outages | 1 |
| 3. Number two plus leave nuclear units out of transaction simulation | 4 |
| 4. Load-to-load | 4 |

Based on the increase of workload, number three is the largest, followed by two, four, and one.

The method of calculating PTDFs that gives DFTF the most technical correct values is number three followed by two and four then one.

Chairman Li proposed dropping options one and two from the list since they (1) provide no improvement and (2) will slow down the weekly update process. A letter will be prepared, by Chairman Li, for SCS on the technical merit of the two remaining options and the incremental work-load associated with each. A trial run for weekly PTDF updating will proceed, using option three. Chi Tang will remove the nuclear units from the scaling process. No opposing votes were voiced.

The trial weekly update will be September 29 and October 6. By September 25 and October 2, the Regional representatives are to submit their transmission and generation topology changes in either a IDEV file or a similar file format to Chi Tang. Appendix D of the Modeling Guideline and Procedure describes the preferred file format.

DFTF members are to submit a list of their nuclear units that are not to be included in the scaling of units for the trial weekly update by September 17, 1997.

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SPSSTF developed a four-stage approach for its flow-base methodology:

1. Do nothing
2. No reservation will mean zero priority
3. Reserve all paths according to transaction participation factor (TPF) impact and subject to acceptable flowgate reliability
4. Reserve on flowgate basis

The do-nothing stage is the current the transmission loading relief (TLR) procedure, and is currently in operation. The second stage allows the operator to cut any transaction, without a reservation on its system. Given the current contract path methodology, the marketers will be left with no options and hence stage two alone is a nonstarter. The third stage is a less risky stage for the marketers. Marketers will have to reserve 100% of the transaction, which imposes a through flow exceeding the threshold TPF on a transmission system. This methodology is similar to the GAPP experiment, differing only in the prime path scheduling and compensation details in the latter. The fourth stage is the FLOBAT method described in the Transaction Reservation and Scheduling Task Force (TRSTF) document approved by the EC and OC. This method will line up reliability flowgates with commercial flowgates.

Chairman Li speculated that there is a relationship between TPF, PFDF, and IPF.

TPF: transaction participation factor estimates the actual usage (through flow)

IPF: interface participation factor

PTDF: power transfer distribution factor.

TPF is a function of IPF but not PTDF. If a gate is an interconnection interface, then the IPF is the PTDF. PTDF can be expressed as a function of IPF by: $[PTDF] * [Adjustment\ factor] = [IPF]$

How does one define the tariff on a flowgate and how to relate the actual flowgate usage to a reliability and commercial basis? Since TPF is a function of IPF there is a means of relating PTDF's to TPF. SPSSTF is proposing a test to see if stage three can accommodate any pricing mechanism. DFTF will need to begin gearing its calculations towards TPF values.

The calculation of TPFs has an over-and-under counting issue that still needs to be addressed. A net interchange method has been used during GAPP to reduce the over-and-under counting problems.

Conrado Caunan distributed the latest version of the Matrix Viewer the week before the meeting. The Viewer includes an ASCII PTDF file and a converter program. Conrado will look into developing a real-time calculation process. The proposed viewer will only calculate the control areas PTDFs the user is requesting, thus reducing the database size.

To insure that DFTF has a good quality data for the matrix, DFTF members need to look at its area in the base case, to verify that the data is correct. DFTF should begin to scrutinize the winter case.

Transaction Management Workshop — September 25-26, 1997

Three tools are to be discussed at the Transaction Management Workshop – IDC, TIS, and TRS. IDC calculates the energy flows, TIS tags the transactions of energy with transaction service information, and TRS provides a transmission reservation and energy scheduling processing system. There is ongoing discussion between the SPSSTF and the Commercial Practices Working Group (CPWG) on who should lead the development of the TRS flow-based methodology.

Updates on PTDF Matrix Calculation

Most of the Regions have submitted the required information for the matrix. AEP has submitted comments on its flowgates. Jon Riley is looking into AEP's concerns. The September matrix will be about one week late due to delays with receiving some of the data.

DFTF will use the winter base case for the December matrix calculation.

Report on Assigned Tasks

Chi Tang currently has not received any contingency lists. The contingency list will allow DFTF to build an outage distribution factors (ODF) matrix for matrix updating after an outage. Chairman Li suggested that a full scale matrix update, after an outage has occurred, may be more practical and will give a more accurate representation of the system. A full matrix recalculation, after an outage, would take about an hour. On this basis, DFTF will not calculate an ODF matrix and hence will not require the Regions to submit the contingency list. DFTF will handle the updating of the matrix, after a contingency, on a request basis.

It is believed that the utility and control area names can be changed to standard names (OASIS names) fairly easily. Chi Tang and Conrado Caunan will take the first attempt at getting a uniform naming convention between the various data sources. The name change will be put on hold until a final decision can be made. NERC should lead this effort.

Roberto Paliza distributed the preliminary results from MAIN's PTDF accuracy testing. Some of the errors are being attributed to the participation points. MAIN is still looking into some of the errors though. Roberto will update the Working Group on any further findings.

Flow-based TRS Table Top Exercise and New Matrices

The flow-based table top exercise is to demonstrate if phase 3 of the proposed process will be functional. To prevent the double counting of net interchange, areas that had a loop flow creating TPF values greater than 100% were placed into a zone. That zone is then used in place of the areas when calculating the net interchange value. One of the problems with this process is that the over counting is only identified for an area with TPF values greater than 100%. Another problem is that under counting can result when two area have ties to a common bus in another system, and the only interaction with the other system was that common bus. This was not seen as much of a problem, but the over-and-under counting of net interchange needs to be addressed, especially in the area which had not participated in the development of the GAPP method. The GAPP Matrix Modeling Guideline and Calculation Procedure describes a method to address this issue. The detailed calculation procedure document also lists the known over-and-under counting cases and describes the procedures used to correct them.

Greg Campoli will be requested to reproduce Appendix A of the GAPP modeling guidelines with the graphics to allow a better understanding of what procedures the GAPP Matrix Subcommittee uses to resolve these issues.

Appendix B of the GAPP modeling guideline and procedure describes the calculation procedure for both the Postage Stamp Method and the MW Mile. Appendix C explains the procedure that was gone through for determining the best way to get solutions, ac or dc analysis.

IDC Development and Matrix Requirements

One of the functions of the IDC security process module would be flagging the next-hour transactions that could cause an overflow. It is also to determine a list of priority or transaction

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schedules the must yield to higher priority transaction schedules. The FLOBAT module assumes that there is TRS software that allows a study mode.

Currently, in the TLR module, iIDC ends at the production of the curtailment list. The IDC will look at the effect that the curtailments have on other flowgates and will modify the list. There will be further assessments to determine the impacts of the modified list. The Transaction Reloading Calculator is a reverse method of the TLR module. Potential problems with reloading could occur during the 20 minutes prior to the hour when the new schedules are received. The transaction submodule is developed to bump low priority transactions and to prevent new transactions that are a lower priority.

If a contingency is the reason for the flowgate to overload, the post-contingency PTDF needs to be applied. Therefor the ODF would need to be applied. Should the PTDFs be a pre- or post-contingency values, still needs to be answered.

A PTDF pre-contingency value is used to determine the curtailment threshold. Apply the PTDF pre-contingency for TLR MW calculation, and update the PTDF if outage is expected to last longer than a specified amount of time. This is currently being done. What is being proposed for future implementation is to apply a post-contingency PTDF for TLR MW calculation and update PTDF if outage is expected to last longer than a specified amount of time.

When the flow-based methodology is implemented, a number of matrices will need to be produced, such as a next hour, day, and week as well as the monthly PTDFs to support transmission reservation.

Updates on NERC MMWG Base Case Development

Some of the problems with the MMWG base cases is to determine what data is included in the models. The MMWG scope needs to be adjusted to accommodate the new requirements for the models. MMWG will be looking very closely at what is being placed in the models. After the spring meeting in Richmond, Virginia, MMWG Chairman Bruce Rew distributed a letter to other NERC working groups asking their needs and expectations of the models. Due to the needs of the ATC calculators, MMWG is creating a spring case, that can be modified for ATC calculations.

Draft Calculation Procedure

All TDFs and TPFs are to be changed to PTDFs. Information on TPF will need to be included. As flowgates get changed we will need to change Appendix B. Instead of changing Appendix B, the documentation will reference the NERC web site: <http://www.nerc.com>.

Future meetings

October 15–16, 1997	Minneapolis	noon to 5 p.m. and 8 a.m. to noon
November 19–20, 1997	New Orleans	noon to 5 p.m. and 8 a.m. to noon (tentative)

Assignments

- The Working Group is to submit to Chi Tang its nuclear units that are not to be included in the scaling of units for the trial weekly update by September 17.
- Working Group members are to review the GAPP modeling procedures and guidelines for discussion at the next DFTF meeting.
- Greg Campoli to reproduce the Appendix A of the GAPP modeling guidelines, with the graphics to allow a better understanding of what procedures the GAPP system uses to account for over-and-under counting.

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- Chairman Li will distribute the GAPP bubble diagrams of specific examples of over counting by September 23 to the next DFTF meeting.
- The July 21-22, 1997 meeting minutes are to be e-mailed to the Working Group. Any comments are to be e-mailed back to NERC.
- Any comments on the draft modeling guidelines are to be submitted to Chairman Li by September 23, 1997.
- Any comments on the draft calculation procedures are to be submitted to Greg Campoli by September 23, 1997.
- Brian Nolan will build a link to the flowgate page and make sure the reference model is posted on the DFTF page.
- NERC staff will continue to look into the consolidation of control area names to get a common name.
- Conrado Caunan will look into developing a real-time calculation process, only calculates the control areas that are being asked for.

Adjournment

The meeting was adjourned at noon on August 26, 1997 by Chairman Li.