

Comment ID	Transfer Scope Page #	Referenced Text	Commentary	Commentor	Type of Change	Theme	NERC Response
1	2	Contingencies Section	1. For the Contingency section, I would add a note that the effect of any existing Remedial Action Schemes will be included in the contingency analysis. As an example, for Manitoba to MISO transfers, we rely on a fully redundant HVdc power runback scheme for loss of a single 500 kv transmission line or single 500/230 kv transformer. We can work with the MRO as needed to explain. Perhaps the regions should put out a request for any special information like operating guides, study procedures or RAS schemes that are used to maximize transfer capability.	Manitoba Hydro (David Jacobson)	Wording/Clarity	Contingencies	This is a good point. The ERO Project Team will work with regions and other relevant entities to try to model as many RAS schemes as the tool will allow.
2	2	Base Case Assumptions Section	Phase shifting transformers can sometimes have special control features. For example, some PSTs in our region block after a certain change in power is detected or if a set number of tap changes (e.g. 4) have occurred and there is no corresponding power order change. Simply enabling PST adjustment could be ok for this study but there could be nuances requiring discussion with the local planning regions.	Manitoba Hydro (David Jacobson)	Discussion Starter	Base Case Assumptions	agreed
3	8	Source and Sink Section	How are "sources" and "sinks" defined in each region? Will it be from "all generation" to "all generation" or a more specific dispatch? Manitoba Hydro is a bit unique in that 70% of our power is connected via HVDC so that setting the dispatch is a bit more complicated than simply changing the power order setpoint on an ac generator. As transfer levels increase, there may need to be some manual adjustment of reactive power resources such as filter banks as not all resources are modeled with automatic switching. Again, we can help the MRO as needed. I'm sure other areas are willing to consult as well on their unique local area approaches.	Manitoba Hydro (David Jacobson)	Wording/Clarity	Source and Sink	The HVDC lines will not be adjusted during transfer analysis and the HVDC will assume to be operating at an appropriate level during the analysis.
4	N/A	N/A	What will the study do if there are resource shortages in one area before the transmission reaches a limit? Will there be scaling of load in the adjacent area? Depending on distances and direction, there can be load diversity that can be tapped into.	Manitoba Hydro (David Jacobson)	Discussion Starter	transfer capability	The current plan is not to scale loads during transfer analysis. If transfers could not be increased due to resource shortages, the study will report a limit and note that a transfer transmission limit could not be determined.
5	2	Base Case Assumptions Section	In the base case assumptions, I think that they should only include proposed generation with both an executed ISA/GIA and full project financing. As has been demonstrated numerous times in recent years in RTQ/ISO footprints, projects can have a fully executed ISA/GIA and never get built because they were not able to obtain full financing to support the project.	Calpine (Brett Kruse)	Discussion Starter	Base Case Assumptions	The most recent and up to date generation forecast plans will be used.
6	2	Contingencies Section	In Contingencies, although though the proposed contingencies reflect standard practice, should we also consider things like aggregations on the distribution system, area-wide IBR failures (Odessa, etc.), fuel delivery failures, wind drop scenarios, and so forth?	Calpine (Brett Kruse)	Discussion Starter	Contingencies	The distribution system will not be analyzed. Certain extreme events like gas shortages or other resource shortages will be studied in part 2 of the analysis.
7	2	Base Case Assumptions Section	MOD-032 cases assume Firm Transfers between the regions, not typical level of transfers for the peak periods. This will tend to understate the base level of transfers in the case.	American Electric Power (Hassan Hayat)	Discussion Starter	Base Case Assumptions	The base cases are expected to represent the peak load periods and the associated base levels of transfer.
8	8	Source and Sink Section	Each Balancing Authority area should be dispatched to a SCED as a starting point, respecting Load + Losses + Typical Transfers = Generation	American Electric Power (Hassan Hayat)	Discussion Starter	Source and Sink	the study will look at the bookend and they might not not provide the optimal dispatch that needed for SCED. Additionally economics dispatch is not in the scope of this study
9	8	Source and Sink Section	SCED Dispatches for this purpose will provide a more reasonable representation of how interregional transfers would occur.	American Electric Power (Hassan Hayat)	Discussion Starter	Source and Sink	economics dispatch is not in the scope of this study
10	8	Source and Sink Section	Each region should provide starting assumptions for Variable Resource dispatch level, as well as a maximum level that could reasonably occur for the study conditions (Summer Peak/Winter Peak). Ramping limits would set as PMAX on these units for scaling purposes rather than nameplate.	American Electric Power (Hassan Hayat)	Discussion Starter	Source and Sink	With ITCs our approach is a bit broader brush than a fine tooth comb. Yes there could be differences between ramping limits vs. PMAX, however, it is expected that those differences should still land our transmission transfer capability limit in the ball park estimate. Further studies will need to be conducted with more detailed assumptions.
11			Shoulder and light load cases would be very instructive for this effort, particularly relative to phase II.	American Electric Power (Hassan Hayat)	Discussion Starter	Base Case Assumptions	Understood, but the study will look at the bookend so that why Summer and Winter were chosen
12			Stakeholder (planning/balancing regions) should be allowed review cases and interim stage results and correct issues, as necessary.	American Electric Power (Hassan Hayat)	Discussion Starter	stakeholder engagement	Stakeholders will be provided opportunities to review and provided feedback as outputs are generated
13			Is the intention to perform gen-gen transfers or gen-load? Both?	American Electric Power (Hassan Hayat)	Discussion Starter	transfer capability	the intention to perform gen-gen transfers
14			Why are offline generators being included in the export sub-system?	American Electric Power (Hassan Hayat)	Discussion Starter	transfer capability	The goal is look at the total generation capacity with all on and off line. If the units are no allowed to be dispatched, it will be included in the exclude file
15			It does not make sense to break up Balancing Authorities into sub-zones unless those BAs do that in reality for their dispatch, e.g., PJM is a single BA, not 3, and their SCED dispatch is done a region wide basis.	American Electric Power (Hassan Hayat)	Discussion Starter	Source and Sink	There are pros and cons to breaking some of the large areas into smaller sub-regions. The approach we are using is to break the system enough so that transmission adequacy could be evaluated within a region or from a sub-region in one FERC Order 1000 region to another FERC Order 1000 sub-region. This would provide further granularity into the analysis and provide information to the stakeholders as to where there is need for additional transfer capability. NERC tried to follow the sub-regions that the FERC 1000 areas used during their assessment.
16			Consider using TARA's Optimal Transfer Functionality. Units that may have significant harming DFAX on a constraint would stop scaling, or even decrease in a market-based transfer because the constraint would drive LMPs for those units down. Similarly, Units with significant helping DFAX would ramp faster.	American Electric Power (Hassan Hayat)	Discussion Starter	transfer capability	Thank you. The study will use the proportional transfer limit method on TARA tool. the study will look at the bookend and they might not not provide the optimal dispatch that needed for SCED. Additionally economics dispatch is not in the scope of this study
17			Consider simultaneous transfer cases and analysis. For example, if PJM is doing heavy transfers to MISO, then it's likely SERC Central is also doing the same, and there is significant DFAX overlap on EHV facilities.	American Electric Power (Hassan Hayat)	Discussion Starter	transfer capability	Simultaneous transfers may be considered on a case-by-case basis and as time permits. Otherwise, these may be considered in subsequent analyses.
18			Include monitoring of < 100 kv facilities which are monitored as Market Flowgates or have the potential to result in re-dispatch of generators.	American Electric Power (Hassan Hayat)	Discussion Starter	transfer capability	NERC's current scope will only include BES facilities, some of which may be less than 100kv.
19		Transfer Directions Section	What is the basis for the 3% OTDF cutoff?	American Electric Power (Hassan Hayat)	Wording/Clarity	transfer capability	3% comes from engineering judgment. This is subject to discussion.
20			PMIN needs to be enforced as well for units ramping down.	American Electric Power (Hassan Hayat)	Discussion Starter	transfer capability	agreed
21		Transfer Directions Section	I have had a difficult time understanding the transfer capability diagram, perhaps it will be reviewed during the upcoming meeting?	American Electric Power (Hassan Hayat)	Wording/Clarity	grammar/formatting	Thank you, we will enhance it to add the necessary clarity
22		Calculation of Transfer Capability	Could you clarify why the base transfers (Page#7) are set to zero and discuss the pros and cons of this approach? This would seem to underrepresent the actual TTC?	Eversource (Mark Tremblay)	Wording/Clarity	transfer capability	The base transfer is based on the tie flows between identified source/sinks areas, a section to show the method will be added
23	1	Cases created through the MOD-032 process will be used as a starting point. Transmission Owners (TO) and Transmission Providers (TP) will be provided an opportunity to review these cases and supply updates using IDEV files. Updates should focus on:	Will there be an option to supply Python scripts as well?	Georgia System Operations Corp (Greg Ford)	Discussion Starter	stakeholder engagement	yes, through regional entities the cases were updated with recenet information
24	7	The FCITC range for the example above would be 100-500 MW. This would be added to the base transfers already modeled to calculate the Total Transfer Capability between the two areas. For simplicity, base transfers are assumed to be zero.	Describe in detail how you arrive at this 100-500 MW range in this example.	Georgia System Operations Corp (Greg Ford)	Wording/Clarity	grammar/formatting	We will update the document and provide more clarity

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25	1	New generation - Generation with a signed ISA should be included in the future year cases	<p>The base case assumptions will likely underestimate resource portfolio changes in 2033. Final ITCS methodology documentation should acknowledge any anticipated underestimation. Future NERC standards or modeling efforts should encourage utilities to update their base cases to meet anticipated changes. Industry working groups and task forces should be leveraged to support utilities in developing and implementing robust methods to better estimate portfolio changes.</p> <p>Using generation capacity in advanced stages of the interconnection queue process is an acceptable way to approximate future generation capacity in the near term, until base case assumptions are updated to better estimate resource portfolio changes as suggested above. However, only including generation in the queues with signed interconnection agreements is likely to still underestimate the future resource portfolio in 2033. Historically, at least 21% of projects which enter the interconnection queues are ultimately energized, while only 13% of generation projects currently in the queues have pending or signed interconnection agreements.</p> <p>1 See Figure 1 for generation capacity (le and the associated withdraw rate (right) of generators in the national interconnection queues by study phase.</p> <p>Generation in their final interconnection study phase, but not yet with signed interconnection agreements, would be a more appropriate choice. It would be appropriate to consider any generation that has made it to at least the facility study phase of the interconnection queues as a proxy for future generation. Generation owners at this phase of the interconnection process have already invested substantial resources to be studied, demonstrating their commitment to being constructed. Further, the withdraw rate for generators in this phase is nearly equivalent to rate for generators with pending or signed interconnection agreements.</p> <p>Regardless of the approach taken, and as indicated above, final ITCS methodology documentation should acknowledge any anticipated underestimation. Considering interconnection reform underway and an anticipated increased success rate of the interconnection queue, future NERC standards and modeling efforts should encourage utilities to update their base cases to match anticipated changes to the resource mix. Industry working groups and task forces should be leveraged to support utilities to identify, develop, and implement more robust methods to estimate portfolio changes at this time when resource mixes are changing rapidly. Would load estimates for 2033 summer and winter from ERCOT not also be necessary? If they are necessary but not provided, how will modeling team resolve this?</p>	DOE (Adria Brooks)	Discussion Starter	Base Case Assumptions	We can include in the report that as assumptions change the analysis results may need to be based on latest forecast info. For ERCOT, the current TC to the Eastern Interconnection will be equivalent to the DC tie TC, so for Part 1, there won't be any additional analysis done for ERCOT. For Part 2 of the analysis, load forecasts from LTRA will be utilized for all areas.
26	3	Non-simultaneous transfer analysis will be performed based on the source and sink definitions identified below for each of the study areas.	<p>Non-simultaneous transfers will overestimate the amount of capacity available during normal operations. Simultaneous transfers which match both normal and extreme operating conditions should be considered.</p> <p>While it may be burdensome to run simultaneous transfer on all possible source-sink combinations in this analysis, certain regional paths of simultaneous transfer concern could be used as examples to demonstrate differences between transfer capability calculations resulting from the two methods. This will help to show where the transfer capability is resource limited or where the transmission system is limited by an aggregate regional import/export limit. This will better demonstrate how the transfer capability can be used to borrow energy from or transfer energy to other regions in a subsequent energy assessment.</p> <p>In TARA, this type of simultaneous analysis could be done, for example, by combining two sink regions into one larger sink and simulating the transfer from their common regional source. Another means could be to create a redispatched case that replicates the maximum transfer capability found in the analysis of the first source-sink transfer analysis, and then run a transfer analysis on that redispatched case to analyze the second source-sink path.</p>	DOE (Adria Brooks)	Discussion Starter	transfer capability	Simultaneous transfers may be considered on a case-by-case basis and as time permits. Otherwise, these may be considered in subsequent analyses.
27	4	Electric Reliability Council of Texas Interconnection: Transfer analysis for the ERCOT interconnection will consist of calculating the capacity of the tie lines with neighboring interconnections.	<p>The Southern Cross transmission line should only be considered in the 2033 transfer capability analysis if and only if it meets the same eligibility criteria as other in development transmission lines being considered in the Eastern and Western Interconnection utility baseline plans. Otherwise, it should be excluded from the study as it is not yet energized, and the results of the study will be erroneous if it is not constructed or energized. Even if it does meet the eligibility criteria, it will not be energized for the 2023 analysis and should not be considered in that year analysis.</p> <p>The three Tenaska plant facilities should also be excluded from this analysis as this does not represent transmission capacity between ERCOT and the Eastern interconnections. Furthermore, the Tenaska facilities are likely already considered as generation in the Eastern Interconnection base cases and including them as interregional transmission capacity will be double counting their contributions. Recommend they be modeled as SPP/MISO generators at their typical, historic generation levels.</p>	DOE (Adria Brooks)	Discussion Starter	transfer capability	Sensitivity analysis could be done to show the result with or without mentioned facilities
28	5 and 6	Export Subsystem File Criteria: Any individual generating unit that meets the criteria below will be excluded from participation: Nuclear Units	Agree that nuclear units can be excluded from this analysis to prohibit any additional increased ramping of the units. Any other generators that traditionally operate at their seasonal maximum and cannot increase output during normal operations could also be excluded.	DOE (Adria Brooks)	Discussion Starter	transfer capability	Thank you, noted
29	6	TARA Transfer Analysis Options: The options below will be selected when performing the transfer analysis: Enable - Ignore initial overloads which have negative DFAX such that increasing transfer will fix the overload.	Agree that any TARA inputs which artificially increase transfer capacities to fix overloads should be disabled.	DOE (Adria Brooks)	Discussion Starter	transfer capability	Thank you, noted
30	N/A	General Commentary	The scope should include timelines / due dates for this part of the study (e.g., Base Case development will be completed by 1/28/2024).	Southern Company (Daryl McGee)	Wording/Clarity	scoping	We have a separate document to track the project milestones
31	1	Transmission Owners (TO) and Transmission Providers (TP)	Change to Transmission Planners to be consistent with NERC definitions.	Southern Company (Daryl McGee)	Wording/Clarity	grammar/formatting	Agreed and consistency will be ensured
32	1	Transmission Owners (TO) and Transmission Providers (TP) will be provided an opportunity to review these cases and supply updates using IDEV files.	When and how will this occur? Will there be a review by the TO/TPs prior to cases being finalized?	Southern Company (Daryl McGee)	Wording/Clarity	stakeholder engagement	TO/TOPs will receive mass communication from NERC twice during the study (first one to be sent out around end of January). First draft of the report may also be sent to TO/TOPs for review.
33	1	Initial Solution Parameters	Need to add similar criteria list shown in the MMWG manual v34 section 6.7 (E) that includes Mismatch Tolerance, etc.	Southern Company (Daryl McGee)	Wording/Clarity	Base Case Assumptions	Thank you, the EI cases do adhere to MMWG practices, reference will be added
34	1	Area Interchange Enabled	does this include the option "Tie Lines and Loads"?	Southern Company (Daryl McGee)	Wording/Clarity	Base Case Assumptions	Yes
35	2	Three types of NERC Category P1 contingencies (100 kV and above) will be used:	For this type of study, recommend using 200 kV and above for contingency analysis. All ties should be included in the contingency list, regardless of kV.	Southern Company (Daryl McGee)	Discussion Starter	Contingencies	All ties will be included and all BES facilities are also part of this study.
36	3	Solution Parameters	why are these options different from the initial solution? Do the solution parameters match what is shown in the MMWG manual?	Southern Company (Daryl McGee)	Discussion Starter	Contingencies	The solution parameters will be different during transfer analysis. In general, they match the manual. Terminology will vary between organizations.
37	4	Transfer capability between the Western Interconnection and Eastern Interconnection will be determined by calculating the capacity of the ties.	Should this be sum of capacity minus the largest single tie (N-1)?	Southern Company (Daryl McGee)	Discussion Starter	transfer capability	This is open to discussion, the study team put this as the appropriate assumption for this study.
38	4	Transfer analysis for the ERCOT interconnection will consist of calculating the capacity of the tie lines with neighboring interconnections. These include:	This should be sum of capacity minus the largest line (N-1)	Southern Company (Daryl McGee)	Discussion Starter	transfer capability	This is open to discussion, the study team put this as the appropriate assumption for this study.
39	4	Southern Cross DC converter to/from MISO South (tentative installation 2029)	Need better description of the these lines to ensure acceptance. What capacity will be assumed for this facility? Will the impact actually be studied to ensure the delivery doesn't impact other utilities systems?	Southern Company (Daryl McGee)	Wording/Clarity	transfer capability	The HVDC lines will not be adjusted during transfer analysis and the HVDC will assume to be operating at the declared capacity level during the analysis.

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40	4	An additional set of transfers will be performed between the FERC Order 1000 areas.	Transferring between FERC Order 1000 planning regions should be the focus of the study. This statement makes it sound like a sensitivity. Recommend moving this section ahead of the sub-regional transfer list.	Southern Company (Daryl McGee)	Discussion Starter	transfer capability	There are pros and cons to breaking some of the large areas into smaller sub-regions. The approach we are using is to break the system enough so that transmission adequacy could be evaluated within a region or from a sub-region in one FERC Order 1000 region to another FERC Order 1000 sub-region. This would provide further granularity into the analysis and provide information to the stakeholders as to where there is need for additional transfer capability. NERC tried to follow the sub-regions that the FERC 1000 areas used during their assessment.
41	4	An additional set of transfers will be performed between the FERC Order 1000 areas.	Need to add definitions (include as part of Appendix I) of what areas are included in each of the FERC defined Order 1000 Transmission Planning Regions.	Southern Company (Daryl McGee)	Wording/Clarity	grammar/formatting	Noted
42	4	An additional set of transfers will be performed between the FERC Order 1000 areas.	"areas" should be changed to "Transmission Planning Regions"	Southern Company (Daryl McGee)	Wording/Clarity	grammar/formatting	we will review the document to be consistent with NERC definitions.
43	5	For base conditions, normal ratings (RATE-1) at ≥ 100 %	This should be "> 100 %"	Southern Company (Daryl McGee)	Wording/Clarity	grammar/formatting	Noted
44	5	Interface thermal/voltage limits	how is this different from "Thermal and voltage limits"?	Southern Company (Daryl McGee)	Wording/Clarity	transfer capability	Changes have been made to the study scope.
45	5	Known transient stability limits	Will there be an actual stability evaluation performed at any point during the ITCS study?	Southern Company (Daryl McGee)	Discussion Starter	scoping	If there is a known stability limit this will be respected, but stability analysis will not be included in part 1.
46	5	A voltage screening will be performed for each transfer direction up to the valid FCITC limit found.	More information should be provided for this analysis, such as: is this under contingency or N-0? What voltage criteria will be used to determine if issues exist?	Southern Company (Daryl McGee)	Discussion Starter	grammar/formatting	The study scope is being revised. Study information is being provided by the transmission planners.
47	5	Each transfer will be simulated until a valid thermal limit is reached while enforcing the sending system's PMAX.	Need to define "valid" to avoid assumption from the reader on what this term means in the context of this study.	Southern Company (Daryl McGee)	Wording/Clarity	grammar/formatting	Noted, rewording to add the needed clarity
48	5	If the transfer does not report any limits, the transfer will be simulated without enforcing the sending system's PMAX.	Why would we fictitiously exceed machine capabilities? Would it be more reasonable that once the sending system's PMAX is reached, load would be scaled down to effectively create additional generation capacity for transfer? Highly recommend NOT ignoring the PMAX values.	Southern Company (Daryl McGee)	Discussion Starter	scoping	The software will report limit when PMAX is reached. The purpose of going above PMAX when a valid transmission limit has not been found, is to find the true transmission limitation.
49	5	Not respecting PMAX values may lead to invalid limits being reported such as overloads on GSU's or lines leaving the plant substation.	How will constrained facilities near the plant substation (beyond the lines leaving) be addressed when the PMAX is not respected?	Southern Company (Daryl McGee)	Discussion Starter	transfer capability	The software will report limit as generation PMAX is reached as well as transmission limitations are encountered during transfer simulation.
50	5	To determine the total transfer capability between planning areas based on 'the wires in the air', the command SCALE ALL FOR EXPORT INCLUDE OFFLINE will be used for export subsystems.	Recommend changing this to "based on the transmission topology included in the study model". In the future year case, transmission that is not yet approved or constructed will be included (and plans could change over time).	Southern Company (Daryl McGee)	Discussion Starter	scoping	agreed, rewording will be done
51	6	Nuclear Units	For export participation, why would we not utilize all available generation, regardless of type? Nuclear generation at less than PMAX should be allowed to participate, unless a plant outage is being simulated for the time period being studied	Southern Company (Daryl McGee)	Discussion Starter	transfer capability	Study scope has been updated. Transmission planners will be deciding which units not to participate. NERC will let industry stakeholders determine whether or not they would like to participate.
52	6	The command, SCALE ALL FOR IMPORT will be used for export subsystems.	This should be "import"	Southern Company (Daryl McGee)	Wording/Clarity	grammar/formatting	noted
53	6	In certain instances, generation may be excluded from participation.	Please include example of what these instances might be	Southern Company (Daryl McGee)	Wording/Clarity	grammar/formatting	Declared future day retirement could be example to exclude
54	6	5 - Max times to report same branch under difference contingencies	typo- change to different	Southern Company (Daryl McGee)	Wording/Clarity	grammar/formatting	noted
55	6	Calculation of Transfer Capability	Recommend modifying this diagram. It is not intuitive and does not seem to be a good reflection of a world-class organization like NERC. For example, there is Planning Area A", but within it there is also an "A" and a "B" without a description of what those are or why there are important. Also, are the lines between the area representative of tie lines? Does subregion D in Planning Area A only directly connect to subregion G in Planning Area B?	Southern Company (Daryl McGee)	Discussion Starter	grammar/formatting	Thank you, will enhance the graph
56	7	For simplicity, base transfers are assumed to be zero.	Does this statement apply to the example above or the study itself? How will base transfers be determined in this Part 1 study?	Southern Company (Daryl McGee)	Wording/Clarity	transfer capability	only the example
57	9	Appendix 1	The SEPA Savannah District is part of SERC East. Need to correct this in the table.	Southern Company (Daryl McGee)	Wording/Clarity	grammar/formatting	Noted, change will be made