

WECC

And now we'll turn to our second issue and we'll hear from Mr. Brian Keel of the Salt River Project and chair of WECC's Reliability Subcommittee.

I wanted to talk with you all today about three topics, the first being what is WECC or W-E-C-C, what is the role in the transmission world of WECC, and what is the Common Corridor Criteria as is called within WECC?

Before we talk about WECC, we need to talk about another acronym, which is called NERC, and NERC stands for the North American Electricity Reliability Corporation, and WECC stands for W-E-C-C- or the Western Electricity Coordinating Council, and those entities, NERC as well as WECC really are empowered to look after the bulk electric system reliability across North America, which is NERC, and across the Western Interconnect, which is for WECC.

But what is WECC? WECC is really, there is a staff of quite a few people in different locations across the western United States, but it's really the transmission owners, transmission providers, generation owners, etc. that are the driving force of WECC. There's many committees, numerous subcommittees of three standing committees of WECC and the WECC board. Numerous subcommittees range from operational through the planning, reliability looking at different ways to do operations, and also aspects of marketing.

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This is a good map that shows what NERC is really. This really covers the United States except Hawaii and Alaska, almost all of Canada and just a little sliver of the Mexican National Grid, which is just the piece in the Tijuana, south of San Diego area. So a few years ago there was a few more of these reliability organizations, as they're called. WECC has always been for the Western Interconnection and there's been some consolidation in the last five years or so, but these are the eight reliability organizations that make up NERC and WECC being one of those reliability organizations.

What are the main roles of those two organizations, or those eight organizations and NERC is really to monitor, assess and enforce compliance with the NERC reliability standards. That has really come to the forefront as a goal for NERC and WECC in the last three to five years. I recall that we had our first audit SRP in 2008, the standards went mandatory and enforceable in I think it was 2007, so before then we did do the standards, did do compliance with standards, but not to the level of importance that it has today.

One other aspect that really comes home as you do a transmission plan or you do transmission planning and development is what's called kind of the Project Rating Review and Planning Project Review within WECC. The first bullet here is Regional Planning. If you have a project, meaning a transmission project where you want to develop new transmission across in the WECC region, or you want to upgrade series capacitors or change out conductors, then the first part is

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regional planning, you lay that project out to your neighbors and across WECC and see if other people want to participate or add other aspects to your project.

The second piece, which is Project Rating Review is a very technical review of the computer modeling that project will be. Now what is a project rating for any project? Really, you can judge whether the project, what kind of megawatt flow or what is the capability that that transmission project would bring once it's completed. The three-phase process is really, once you start initially, the second phase is where the technical studies are done and in the third phase is when that is actually built. And across WECC there is many across the different areas of the Western Interconnect, a lot of projects going on at any time, and WECC makes sure that all WECC members are kept up to date for the projects that are going on across WECC.

There is a difference between NERC and WECC as far as standards and criteria. NERC standards are, like we said earlier, sanctionable and enforceable, and you may have heard the statement that any violation can go up to \$1 million dollars per violation per day, so it is very serious business for all utilities and all that NERC compliance is very serious for us. It is enforceable, NERC and as well for FERC, the Federal Energy Reliability Corporation.

Criteria is a little bit different. Criteria for WECC is nonsanctionable, nonenforceable, but all WECC members do abide by regional criteria. More

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particularly for what we're talking about here is what the next two main bullets are, which is NERC Category C. When you do planning studies, you take out multiple failures or two circuits on the same tower, that is a NERC Category C outage or contingency and there are performance requirements that you must demonstrate in your planning case that you meet with your system by the outage of those two circuits on the same tower. The WECC Regional Criteria and it's called WECC WRS 1.1, is more onerous or goes beyond just the Category C of what we described there. It's really the multiple failure or two circuits in a common corridor. So the NERC standard that everybody across NERC has to abide by is two circuits on the same tower, and for WECC members two circuits as well in the same tower, but also two circuits that happen to be in the same common corridor.

Just for demonstration here, I have a picture of transmission line being built in the south and east of the Phoenix Metro area. You see on the left this is a double circuit, but what is a circuit? If you see on the left we have three arms sticking out horizontally and then insulator strings coming down from those, and then there would be conductor hung on each one of those three so that three conductors on the left side would make up a circuit. And you would have the same on the right side, the three arms coming out horizontally, and then conductor or conductors hung from the insulators, and that would be another circuit.

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Okay, back to the WRS 1.1 or the Common Corridor Criteria. Again, it's the multiple failure of the common mode outage of two circuits as we saw there in a corridor. Also, that's not the same as those two circuits which are on the same tower, and they have to be adjacent. In other words, there does not have to be any other circuits in between. They can be in the same corridor definition, the width of a corridor, but there could be other circuits in between and that makes them nonadjacent.

Here's the picture of common corridor, two circuits in a common corridor on the west of the Phoenix Metro area. You see again here we have two circuits, three strings of conductor, and conductor could be just one conductor or in this case I think we have three or four, this is a bundle conductor. So this shows what a common corridor looks like with two circuits.

What is the definition? There was a long time that this criteria has been in place, but there was not a definition of what is a common corridor. There was never that definition and everybody had really left that up to their interpretation, which is kind of unfair. So a few years ago in the Reliability Subcommittee, probably five or six years ago, there was a push to develop this definition and it came through and took it up to the WECC Board of Directors and that was approved, so that's what this definition is used today. Two circuits have to be in the same right-of-way or parallel to each other. The center line separation is either the longest span or 500 feet, whichever is greatest. To get into the 500 kV EHV circuits the

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spans are quite long, so it's typically going to be the longest span of those. And again, we talked about transmission circuits, which are adjacent with no other transmission circuits between them. So that tells you what the definition of two circuits in a corridor and that, why we described that is that tells you what apply for that extra performance criteria when you do planning studies.

Now this criteria has been around for probably as long as WECC has been around, probably since the, we talked to individuals around WECC that they've known this criteria has been around since probably the 1960s or 1970s. And a few years ago, probably a year and a half ago in the Reliability Subcommittee we started asking the question if it was still the thing to do? Was it really beneficial for transmission owners and transmission developers across WECC to continue with that or not? And so through the WECC process we started kind of a standards process, a draft team to look at that Common Corridor Criteria and just see if that is really applicable today, and what changes, if any were warranted based on today's conditions versus 40 years ago? Is there really a reason to change that and if so, there's many ways you can change that corridor criteria in either through the definitions or total elimination.

Progress to date, the standard draft team began in earnest in May. There has been three meetings where really we've gotten together, understood what our job is, looked at this corridor criteria and its impact to transmission developers to utilizes, transmission owners to get different perspectives of what those are, and

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we had a meeting a few weeks ago to really take the whole basket of the options and start pushing them down to find out what the draft team wants to go to as a result.

Here's a picture of three circuits in a corridor. This would be applicable, let me describe what you would study real quick as far as when you look at these three in a corridor. On the left side, from left to right you have an A, B and C circuit here and say the one A and B would be studied as being in a common corridor and B and C would be studied as being in a common corridor because they are contiguous or adjacent to each other, but not A and C.

This is an example of what can happen if you have a lot of circuits in a common corridor or a common area. They are exposed to different initiating events which could take out all those circuits at one time. This is a picture taken from a helicopter looking down at the, this is again southwest of the Phoenix Metro area, this is from a riverbed fire a few years ago, which got up into the vegetation on land here of course those circuits would've been taken out of service if they had known the fire was there or the smoke would have initiated opening those circuits.

Okay, this is the results from a White Paper that was written by a SWAT group, SWAT meaning Southwestern Area Transmission Group, which is a subregional planning group of WECC, and this White Paper looked at the cost versus the

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reliability of moving the separation between two circuits closer or further apart. And the increase of separation, I'll go through these bullets real quick. The increase of separation may not measurably, this is a summary of the items from the White Paper, separation and increase of separation may not measurably improve reliability of the circuits, does require additional cost, may increase land use restrictions, could cause creation of additional corridors, and potentially create difficulties siting across public lands.

Okay, in summation of my comments, we went over what is WECC, what is the role of WECC in transmission planning, and the Common Corridor Criteria. With that, I'll conclude my remarks at this time.