

1 permit application or the BACT analysis will
2 follow, to the extent possible, USEPA's topdown
3 five-step BACT process.

4 And I think most of the states also
5 follow the five-step topdown BACT process in
6 their review of the permit -- of the BACT
7 analysis and in their preparation of their own
8 BACT analysis.

9 The one exception that I would -- that
10 I'm aware of is in the state of Texas. They have
11 a tiered BACT approach where Tier 1 is if you can
12 show or find a similar source that was recently
13 permitted with BACT, that that generally
14 constitutes BACT for your facility unless you can
15 point to some control technologies that can
16 provide a more -- or achieve a more stringent
17 emission rate.

18 So the state of Texas uses a somewhat
19 different approach, but in general, most of the
20 states follow, to the extent possible, the
21 topdown five-step BACT approach that's described
22 in USEPA's New Source Review Manual.

23 Q And does Wyoming follow that
24 approach?

25 A I believe they followed that

1 approach in the review of -- in their review of
2 the BACT analysis that was submitted for Basin
3 and in the preparation of their BACT analysis.

4 Q So if you're going into a state
5 and you're going to be preparing a BACT analysis
6 or commenting on it, I assume you would look at
7 the New Source Review Manual. Are there any
8 other --

9 Well, is that correct?

10 A The New Source Review Manual is
11 one of the documents that we look at to provide
12 guidance in the preparation of a BACT analysis.

13 Q And what other documents might
14 you look at before you do that?

15 A To prepare the BACT analysis?

16 Q Yeah.

17 A Well, the main guidance document
18 that describes the methodology for preparing a
19 BACT analysis is USEPA's New Source Review
20 Manual.

21 But in the preparation of a BACT
22 analysis, you know, Step 1 of the BACT analysis
23 is to identify the available control technologies
24 that may be applicable to your facility.

25 So then in that case, you would review

1 a number of technical documents or literature to
2 try to identify which control technologies might
3 be available.

4 And then another source of information,
5 I think, is to look at permit applications that
6 have been submitted for other projects or
7 prepared by others, to see how the BACT analyses
8 were prepared for those permit applications.

9 Q And in terms of the process
10 itself, the topdown process, are there typically
11 state regulations that govern how that's done?

12 A No.

13 Q And are you aware of whether
14 there are any in Wyoming?

15 A I'm not aware of any regulations
16 in Wyoming that describe the methodology that
17 should be used for a BACT analysis.

18 Q You kind of gave us a time line
19 of the permitting process earlier, and can you
20 describe for me how the BACT analysis fits into
21 that overall process.

22 A I would say in general, the BACT
23 analysis is the -- one of the two major issues
24 that are reviewed during the permitting process.
25 The BACT analysis gets a lot of scrutiny from the

1 other than the materials of constructions --
2 construction would be different so it could
3 handle the higher temperatures and pressures.

4 Q Wouldn't -- when you say you
5 can't describe the details of the differences,
6 why is that?

7 A My background isn't in the design
8 of supercritical or subcritical boilers. Sargent
9 & Lundy is a big engineering firm and we have
10 people within the firm whose job it is to design
11 the detailed components of either a subcritical
12 or supercritical boiler. So I would rely on
13 those folks if I needed to get into that type of
14 detail in boiler design.

15 Q So a general sense of the parts
16 but not the details?

17 A Right.

18 Q Could you describe for me any
19 similarities between a subcritical PC boiler and
20 a supercritical PC boiler?

21 A They would both fire pulverized
22 coal; they both generate steam, although steam
23 conditions are different; and then that steam is
24 used in the steam-turbine generator to generate
25 electricity.

1 to blading within the turbine -- blade sizes,
2 rotor design, and dynamics -- but beyond -- and
3 materials of construction, but beyond that, I
4 can't describe detailed design differences.

5 Q And you mentioned the inter-
6 mediate turbine. What are the differences there?

7 A They would be similar: blade
8 design, materials of construction, but beyond
9 that, I can't describe the detailed differences.

10 Q Are there any other differences
11 in the steam-turbine generator between the two?

12 A There would be differences --
13 well, no other differences that I can describe
14 with the steam-turbine generator, no.

15 Q What about similarities?

16 A Well, both are designed with
17 rotors and blades that are turned by the steam to
18 turn the generator and generate electricity.

19 Q Anything else?

20 A Not that I -- not that I can
21 describe.

22 Q Do they both involve high-
23 pressure and intermediate-pressure turbines?

24 A A steam turbine with a super-
25 critical cycle and a steam turbine with a

1 A It's my understanding that Basin
2 went through a comprehensive review of the
3 generating technologies that were available to
4 them. That review would have included the
5 electricity needed -- that they needed to
6 generate, so the size of the facility; it would
7 have included the technologies that are available
8 to generate that electricity; the cost of those
9 technologies; the availability of those
10 technologies; their operating history with those
11 technologies; and whether or not those
12 technologies were, I guess, economic for the Dry
13 Fork Station.

14 There was probably other considerations
15 that they took into -- other things that they
16 took into consideration, but I'm not -- I wasn't
17 involved in the project at that time.

18 Q Did they evaluate supercritical
19 technology through the topdown BACT analysis that
20 we talked about?

21 MR. DAY: Object to the form of
22 the question and foundation.

23 A Supercritical -- supercritical
24 technology was not included in the topdown BACT
25 evaluation for the Dry Fork Station. Super-

1 critical technology was evaluated separately
2 during the generating-technology evaluation
3 conducted by Basin.

4 Q (BY MS. COOLEY) What do you mean
5 by the "generating-technology evaluation"?

6 A Well, again, I think Basin went
7 through an evaluation of the generating
8 technologies that might be available to them,
9 including the things that I just described. So
10 it would have been based on the amount of
11 electricity that they needed, whether or not they
12 needed baseload electricity or peaking capacity,
13 what size of a boiler they might need, or what
14 size of a generating facility they might need,
15 the available fuels, the available generating
16 technologies and whether or not those
17 technologies would meet there needs, and then the
18 cost of those technologies.

19 And, again, I'm sure that evaluation
20 included other considerations that I'm not aware
21 of.

22 Q And to your knowledge, is there
23 any law or regulation that governs that
24 evaluation?

25 A Not to my knowledge, no.

1 Q Can the company choose to look at
2 whatever factors they want to?

3 MR. DAY: Object to the form of
4 the question, vague.

5 A I think -- yes, I think the
6 company, during that phase, can evaluate whatever
7 factors they think are important to them, yes.

8 Q (BY MS. COOLEY) Can they
9 eliminate a generating technology because of any
10 increase in cost?

11 A Well, I think they can at that
12 phase -- and, again, this is not the permitting
13 phase of the project; so it's not the phase of
14 the project that I'm most familiar with -- but I
15 think at that phase of the project, the company
16 can evaluate all the generating technologies that
17 are -- that are potentially available and compare
18 it to the electricity needs that they have and
19 demand growth and the demand for electricity that
20 they see, and determine whether or not those
21 generating technologies suit their needs based on
22 what's important to them. And I would think
23 economics would be one of the items that would be
24 important to them.

25 Q But is it the permit -- or, I'm

1 sorry -- the plant proponent that has the
2 ultimate say as far as what generating technology
3 they choose?

4 A Yeah, I think the proponent has
5 the ultimate say in the generating technology
6 that they propose for their project.

7 Q So assuming we're at the next
8 stage, the permitting process, does the agency
9 reviewing that permit have any authority to
10 require the project proponent to consider a
11 different generating technology?

12 MR. DAY: Object to the extent it
13 calls for a legal conclusion.

14 A I think the permitting agency,
15 at least with respect to emissions and emission
16 controls and the BACT determination, evaluates
17 control technologies as they apply to the
18 generating technology or the source, the
19 emissions source as defined by the proponent.

20 Q (BY MS. COOLEY) And when you say
21 "source," are you equating that to generating
22 technology?

23 A In this case, I am. It's the
24 emissions source, yes.

25 Q And what is the emissions source

1 at the Dry Fork Station?

2 A Well, there are several emission
3 sources at the Dry Fork Station. The main source
4 will be the boiler, the stack from the boiler.
5 But then there's other sources: There's an
6 auxillary boiler and there's an emergency
7 generator; there's the material-handling emission
8 sources, and probably others. So there's several
9 emission sources at the Dry Fork Station.

10 Q And then in terms of the various
11 emission sources, which of those -- sorry. Let
12 me start over.

13 Of the emission sources that you just
14 named, with which ones are there a distinction
15 between subcritical and supercritical
16 technologies?

17 A The only one that I'm aware of
18 would be the pulverized-coal boiler that can be
19 designed either as a boiler that generates
20 subcritical steam or a boiler that generates
21 supercritical steam.

22 The other emission sources that I
23 listed, there would be -- they don't fit into
24 that category of subcritical versus
25 supercritical.

1 Q Can you turn back to your expert
2 report at page 16. I'm looking at the very last
3 paragraph. In the middle of that paragraph,
4 there's a sentence starting with "First." Would
5 you please read that sentence aloud for me.

6 A "First, a comparison of
7 subcritical and supercritical boiler designs is
8 not included as part of the BACT analysis because
9 supercritical technology would require BEPC to
10 redesign the boiler and would constitute
11 redefining of the emissions source."

12 Q Can you explain to me what you
13 mean by "redefining of the emissions source."

14 A It's simply the emissions source
15 as defined by the proponent.

16 So "redefining the emissions source"
17 would mean redescribing the source of emissions
18 as described by the proponent.

19 I wouldn't want that read back.

20 Q So whatever the proponent picks
21 as its emission source, any change to that is a
22 redefining of the emissions source?

23 MR. DAY: Object to the form of
24 the question. It mischaracterizes his testimony.

25 A I would say if the agency wanted

1 the proponent to build something different than
2 what they proposed, that that would constitute
3 redefining of the emissions source.

4 Q (BY MS. COOLEY) What if the
5 project proponent proposed a -- I might say this
6 wrong -- but a Stoker technology, and the agency
7 asked them to consider a subcritical boiler?
8 Would you consider that redefining the emissions
9 source?

10 A Yes.

11 Q I'd like to get at the difference
12 between what you called practical -- or practical
13 generating technology in your report and
14 redefining the emissions source.

15 Are those the same analysis or
16 different?

17 A I'm sorry, can you repeat that
18 question?

19 Q Sure. We talked previously about
20 how the project proponent chooses their
21 generating technology. Would you consider the
22 same factors when you're deciding whether or not
23 they redefine their emission source, or are those
24 two totally separate analyses?

25 MR. DAY: Object to the form of

1 at BACT analyses that were prepared by EPA and by
2 state permitting agencies. So I would include
3 BACT analyses that were prepared by EPA as some
4 of the input into the preparation of a BACT
5 analysis.

6 Q Would you consider a BACT
7 analysis prepared by the EPA to be persuasive
8 authority?

9 MR. DAY: Object to the form of
10 that question. I'm not sure I know what it
11 means.

12 A I would find a BACT analysis
13 prepared by EPA to be more persuasive than a BACT
14 analysis prepared and submitted with the permit
15 application. I think it -- and I would also find
16 BACT analyses prepared by permitting agencies to
17 be more persuasive because I think those analyses
18 have been prepared after a lot of review. So I
19 -- BACT analyses that are prepared by the
20 permitting agencies after some review and some
21 discussion and comment, I would find those to be
22 a better reference source than BACT analyses that
23 are submitted with permit applications.

24 Q (BY MS. COOLEY) Are you familiar
25 with the Deseret Power Electric Cooperative power

1 these more onto an apples-to-apples comparison.

2 Q Would you agree that there are
3 supercritical units that have been installed and
4 operated successfully in the 300 to 450, let's
5 say, net megawatt range?

6 A In the world, yes; yes, I would
7 agree.

8 Q And would you agree that a
9 422-megawatt supercritical facility is
10 technically feasible at the Dry Fork Station?

11 A I think the Dry Fork Station, at
12 422 megawatts gross, could be designed as a
13 supercritical unit, yes.

14 Q So would you agree it's
15 technically feasible?

16 A Yes.

17 Q I'd like to go back to your
18 expert report at page 16 and 17.

19 Does your report, in your opinion,
20 contain a topdown BACT analysis comparing
21 supercritical and subcritical technology?

22 A No, it doesn't include a topdown
23 BACT analysis comparing subcritical and super-
24 critical, but it compares -- it includes what I
25 would characterize as some parts of the topdown

1 BACT analysis.

2 Q Which parts?

3 A It includes an estimate of the
4 overall emissions from both units, and it
5 includes total annual costs from both units, and
6 it includes what would be the cost-effectiveness
7 evaluation, which would be done in Step 4 of a
8 topdown BACT analysis.

9 Q Am I correct that it's your
10 opinion in your report that supercritical would
11 be rejected at Step 4 based on cost
12 effectiveness?

13 A No. No. I think -- I don't
14 think supercritical would be included in a BACT
15 analysis. I think it's redefining the source,
16 and I don't think it's appropriate to include a
17 supercritical boiler design in the BACT analysis
18 for the Dry Fork Station.

19 Q Assuming that it is required,
20 that it's not redefining the source, and you had
21 to do a BACT analysis, is it your opinion that
22 supercritical would be rejected at Step 4 based
23 on cost?

24 A Assuming that that supercritical
25 should be included in a BACT analysis and

1 compared to a subcritical unit, I think for the
2 Dry Fork Station, the supercritical unit would be
3 excluded from BACT at Step 4 based on the cost
4 considerations, yes.

5 Q Okay. Where did you obtain the
6 cost estimates that you used in your report?

7 A The cost estimate for the
8 subcritical unit is based on the actual cost
9 estimate that Sargent & Lundy has prepared for
10 the Dry Fork Station. So it's based on a
11 detailed cost estimate that Sargent & Lundy has
12 prepared during the design phase of the Dry Fork
13 project.

14 And then I used a USEPA document that
15 included a comparison of subcritical and super-
16 critical boiler designs to develop the difference
17 in capital costs for the subcritical and super-
18 critical units, and also to calculate the annual
19 operating costs for the subcritical and super-
20 critical units.

21 Q And where did -- where does EPA
22 get the information that's in the report that you
23 relied on?

24 A I don't know where they got the
25 information. I think EPA developed the cost