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IDAHO PUBLIC
UTILITIES COMMISSION

BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

**IN THE MATTER OF THE APPLICATION
OF IDAHO POWER COMPANY FOR A CER-
TIFICATE OF PUBLIC CONVENIENCE AND
NECESSITY FOR THE RATEBASING OF
THE MILNER HYDROELECTRIC PROJECT
OR IN THE ALTERNATIVE A DETERMIN-
ATION OF EXEMPT STATUS FOR THE
MILNER HYDROELECTRIC PROJECT.**

CASE NO. IPC-E-90-8

**DIRECT TESTIMONY OF THOMAS FAULL
IDAHO PUBLIC UTILITIES COMMISSION
NOVEMBER 9, 1990**

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Q. Please state your name and business address for the record.

A. My name is Thomas Faull and my business address is 472 West Washington Street, Boise, Idaho.

Q. By whom are you employed and in what capacity?

A. I am employed by the Idaho Public Utilities Commission as a Public Utilities Engineer.

Q. Have you included a statement of your qualifications in this testimony?

A. Yes. Exhibit No. 101 is a statement of my qualifications.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to discuss the cost effectiveness of Idaho Power Company's (IPCo's) proposed project, to provide an engineering opinion as to the appropriateness of the project, and to recommend Commission action relative to the project.

Q. Why is it important to know the cost effectiveness of a project when determining whether or not to grant it a Certificate for the present Public Necessity and Convenience (Certificate)?

A. Although the basic criterion for granting a Certificate is "need for power", the criteria for determining the applicability of a Certificate to a

1 specific resource should include the cost of generation
2 from that resource relative to other potential
3 resources.

4 Q. What is the starting point for analyzing
5 the cost effectiveness of this project?

6 A. First, one must attempt to quantify the
7 construction cost of the project, then translate that
8 cost into a unit cost of generating energy.

9 Q. What do you estimate the cost of this
10 project will be?

11 A. Rather than estimating the construction
12 cost of the project, I have accepted IPCo's proposed
13 cap on capital costs of \$63,350,600 as a maximum (or
14 worst-case) cost. Then, from that I estimate the 46
15 year levelized cost to ratepayers for this project will
16 be \$62.73/MWh.

17 Q. In his testimony Mr. Keen stated that he
18 estimated the cost of energy from this project to be
19 52.93 mills /kWh (\$52.93/MWh) based on 60 years of water
20 data or 37.80 mills/kWh (\$37.80/MWh) based on 20 years
21 of water data. Can you explain the differences between
22 his estimates and yours?

23 A. Yes. There are several differences.

24 First, I did not consider the case of 20
25 water years. In Order No. 20924 (Case No. U-1006-265)

1 the Commission ordered IPCo to use the most recent 20
2 years of water data for retail ratemaking purposes,
3 rather than all available water data. This methodology
4 resulted from statistical evidence supporting 20 years
5 of data being the best predictor of the flow in the
6 year immediately following that period, and was based
7 on the assumption that retail rates are set relatively
8 often. Thus it was determined that 20 water years is
9 the best predictor for short term analyses such as
10 those that apply to retail rates. However, for a long
11 term analysis such as determining the value of genera-
12 tion from a resource with a 46 year life, one should
13 use a larger data base -- in this case, 60 years of
14 water data. The average of stream flows over this
15 period are lower than over the 20 years used by
16 Mr. Keen, which reduces the estimate of annual average
17 generation and increases estimates of energy cost.

18 Second, Order No. 23357 (Case No.
19 IPC-E-89-11) established the following capital struc-
20 ture for determining the cost of long term generating
21 resources on IPCo's system.

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<u>Component</u>	<u>Cost</u>	<u>Ratio</u>
Debt	10.30%	50%
Preferred	10.29%	10%
Common	13.17%	40%
Weighted Cost	11.447%	

I used this capital structure in my analysis, rather than the capital structure used by Mr. Keen, which was:

<u>Component</u>	<u>Cost</u>	<u>Ratio</u>
Debt	10.00%	50%
Preferred	9.50%	10%
Common	12.25%	40%
Weighted Cost	10.857%	

Using the larger cost of capital increases the estimated cost of generation.

Third, Mr. Keen used an estimated annual Operations and Maintenance (O&M) cost of \$272,217. My analysis of IPCo's historic operating costs for the years 1985 through 1989 indicate that the appropriate O&M cost estimate for a project of this size is \$14/kw. That yields an annual O&M cost of \$815,780 in 1992 dollars, which is the value I used in my estimate for this project's cost. This change also increases my estimated cost of generation over Mr. Keen's estimate.

1 Fourth, Mr. Keen used an annual average
2 generation of 194,700 MWh in his analysis. However,
3 IPCo indicated in the FERC license application that
4 the actual expected generation would be 186,395 MWh
5 because of unit unavailability. Therefore, I used
6 186,395 MWh/yr in my cost analysis for this project,
7 which further increased my estimate over Mr. Keen's.

8 Fifth, Order No. 23357 determined that
9 the appropriate escalation rate for determining the
10 cost of resources on IPCo's system is 4.5% per year.
11 This is the escalation rate I used in my analysis,
12 rather than the 4.0% per year used by Mr. Keen, again
13 resulting in a higher estimate than Mr. Keen's.

14 I must also note that both Mr. Keen and
15 I used 0.7381% of capital cost as the property tax
16 rate for our analyses, even though Order No. 23357
17 required 1.0% as the property tax rate for the
18 Surrogate Avoidable Resource (SAR) of the avoided cost
19 determination. I accepted Mr. Keen's rate because I
20 assume that IPCo is much more capable of accurately
21 estimating the property tax rate of hydro plants in
22 Idaho than any of the parties were of estimating the
23 property tax rate of a coal fired plant in Wyoming.

24 Q. Can you further explain the analysis you
25 did to estimate annual O&M costs?

1 A. Yes. Using pp. 406-A through 407-B of
2 IPCo's FERC Form 1, I determined the rated capacity,
3 net generation, and variable operating cost for each
4 year from 1985 through 1989, inclusive, for each of
5 IPCo's 14 major existing hydro electric plants. Using
6 Consumer Price Index (CPI) data and the escalation
7 rates required in Order No. 23357 for future years, I
8 adjusted the cost data to 1992 dollars. I then
9 computed the cost per kW of rated capacity for each
10 year for each plant. After a subjective determination
11 that the variation from year to year of the costs per
12 kW of capacity was acceptable, I averaged the 5 years
13 of data for each plant. I then graphed the cost per
14 kW relative to the rated capacity. The resulting graph
15 is included as Exhibit No. 102, and the data from which
16 Exhibit No. 102 was derived are included as Exhibit No.
17 103.

18 As can be seen from Exhibit No. 102, the
19 data yield a relatively smooth curve, except for one
20 significant hydro plant, so it is reasonable to inter-
21 polate between data points provided there is a reason-
22 able explanation for the aberrant plant. The aberrant
23 plant is Swan Falls, which is substantially more
24 expensive to operate than would be expected in
25 comparison to IPCo's other plants. Although I didn't

1 confirm it, I assumed that the excessive cost of Swan
2 Falls is due to its remote location and antiquated
3 control system. Thus, it is apparent from the graph
4 (Exhibit No. 102) and the data from which it was
5 developed (Exhibit No. 103) that one should expect
6 IPCo to experience O&M costs of about \$14/kW for a 58
7 MW hydro plant. This is the rate I used in my
8 analysis. It must be noted, however, that because the
9 Milner Plant will be an integral part of a complex
10 irrigation system, it would not be unreasonable to
11 assume that its operating costs might be relatively
12 higher than IPCo's other plants, as compared herein.

13 Q. According to Order No. 23357, the maximum
14 avoided cost rate available to Qualifying Facilities
15 (QFs) in Idaho [as defined under the Public Utility
16 Regulatory Policies Act of 1978 (PURPA)] coming on
17 line in 1992 is \$57.53/MWh. In light of this, do you
18 consider your estimated cost of \$62.73/MWh to represent
19 a cost effective project for IPCo's ratepayers, at
20 least as compared to avoided cost rates?

21 A. Yes, I do. For at least three reasons,
22 the published avoided cost rates are not appropriate
23 for direct comparison to a cost estimate of a specific
24 project. First, the computer model that computes the
25 published avoided cost rate assumes a "first deficit

1 year" (i.e. year of new resource need) of 1993 for
2 IPCo. I currently believe that, as clearly explained
3 in IPCo's petition for reconsideration in Case No.
4 IPC-E-89-11, the correct first deficit year should
5 have been 1994. Based on the assumption that the
6 Commission will authorize this change, I have deter-
7 mined that the comparable avoided cost rate (without
8 "tilting") would be \$50.40/MWh.

9 Second, the published rates include an
10 adjustable portion of \$8.78/MWh that will be adjusted
11 in the future based on actual operating costs of the
12 Colstrip coal fired generating plant. For direct
13 comparison to an actual project the adjustable portion
14 should be assumed to escalate at the same rate as
15 comparable costs associated with the actual project.
16 When this adjustment is made the comparable 20 year
17 avoided cost rate (without "tilting") is \$60.12/MWh.

18 Third, even as adjusted above, the
19 published avoided cost rates apply only to projects
20 with a 20 year availability to IPCo. Although there
21 have been numerous arguments made about the unfairness
22 of limiting QF contracts and their rates to 20 years,
23 nonetheless, from a ratepayer viewpoint IPCo's 46 year
24 project should be compared to 46 years of avoidable
25 costs. That is, when IPCo builds a resource with a 46

1 year life ratepayers can reasonably expect that they
2 will have access to the energy from that resource for
3 the full 46 years, so other resource costs can be
4 avoided for the full 46 years.

5 Using the SAR methodology specified by
6 the Commission, assuming a new SAR will be built at
7 the end of the 35 year life of the first SAR, assuming
8 a first deficit year of 1994, assuming that the adjust-
9 able portion will escalate, and assuming an on-line
10 year of 1992 yields an avoided cost of \$65.28/MWh.
11 Taking into account the seasonality weighting of
12 avoided costs relative to the availability of the
13 Milner Plant reduces the value of the avoided costs
14 applicable at Milner to \$61.35/MWh. This is the
15 appropriate avoided cost rate to use for determining
16 the cost effectiveness of the Milner Plant.

17 Thus, the Milner Plant, with an estimated
18 cost of \$62.73/MWh is cost effective within reasonable
19 limits of estimating accuracy. ($62.73/61.35 = 102.2\%$)

20 Q. You indicate that there has been a
21 Petition for Reconsideration of Order No. 23357 filed
22 that could affect the "first deficit year" of the
23 avoided cost computation. Are there any other issues
24 pertinent to that petition that might affect the
25 avoided cost rate comparable to the Milner Plant?

1 A. There is a potential that a mathematical
2 error made in Case No. WWP-E-89-6 will cause a change
3 in the estimated cost of transmission construction in
4 that case and that the WWP transmission cost change
5 will flow through to Case No. IPC-E-89-11, thus slightly
6 reducing the avoided cost rates comparable to the
7 Milner Plant. I would expect that change to be less
8 than 3% of avoided cost. Otherwise, I believe that
9 none of the issues pertinent to the petition for
10 reconsideration of Order No. 23357 will affect the
11 avoided cost rate that is comparable to the Milner
12 Plant.

13 Q. Suppose for a moment that, as a result
14 of this (or some future) proceeding, the estimated
15 cost of the Milner Project is found to be substantially
16 greater than your estimate or the comparable avoidable
17 costs are found to be substantially less than your
18 estimate. For example, assume that the Commission
19 determines that the Milner costs should be compared to
20 the interim 20-year avoided cost rates in effect prior
21 to Order No. 23357. Under those conditions, would you
22 still consider the Milner Project to be cost effective?

23 A. No. Under those circumstances I believe
24 IPCo should be limited in its recovery to an accurate
25 Commission determined comparable avoided cost rate.

1 Q. Other than using pre-Order No. 23357
2 avoided cost assumptions, are there any obvious condi-
3 tions that might be found appropriate for reducing the
4 comparable avoided cost rate for evaluating the Milner
5 Plant?

6 A. Yes. The computation of avoided cost
7 rates for purpose of evaluating capacity and energy to
8 be purchased under PURPA specifically excludes the use
9 of projected future purchases of QF power and demand
10 side resources (conservation) for estimating the first
11 year of power need for each utility. Although this is
12 appropriate for PURPA applications (as explained else-
13 where, including in Order No. 22636), it could easily
14 be argued that it is not appropriate for evaluating
15 the utilities' proposed resources.

16 This is especially true in the case of
17 conservation resources. The Commission has been
18 encouraging Idaho utilities to acquire cost effective
19 conservation resources for years, but with little
20 avail. Now, when it appears that new resources are
21 needed, the utilities have little conservation
22 "on-line", and are essentially unprepared to aggres-
23 sively bring such resources on line. Therefore, it
24 appears inequitable to ascribe a benefit to IPCo in
25 evaluating its supply side resources by ignoring the

1 utility's apparent negligence in acquiring demand side
2 resources. I believe the Commission should consider
3 imputing prior and future demand side resource
4 acquisition to IPCo for the purpose of evaluating
5 proposed supply side resources, including the Milner
6 Plant.

7 Q. Wouldn't such limitations unfairly deny
8 IPCo from recovering prudently incurred investment
9 costs?

10 A. No. IPCo made its decisions, commit-
11 ments, and contracts relative to this Project without
12 a Certificate, even though one was clearly required
13 prior to beginning "construction". Furthermore, it
14 did so while fully aware of the interim avoided cost
15 rates, while arguing for future avoided cost rates
16 substantially less than those included in Order No.
17 23357, while fully aware of the Commission's position
18 on cost effective conservation resources, and while
19 fully aware of the SAR methodology ordered by the
20 Commission. Therefore, based on the knowledge and
21 assumptions that IPCo was publicly espousing at the
22 time it made those decisions, commitments, and
23 contracts relative to this Project, they appear, on
24 their faces, to have been imprudent. It is only as a
25 result of chance that the decisions have subsequently

1 turned out to appear marginally prudent (at least as
2 determined by my analyses). Therefore, if it is
3 determined that my analyses are in error and that the
4 Milner Project costs are *not* less than avoided costs,
5 IPCo should be imputed to have known that the project
6 was not cost effective, at least to the extent that
7 Milner costs exceed avoided costs using the assumptions
8 included in IPCo's recommended avoided costs in Case
9 No. IPC-E-89-11 and, perhaps, imputed conservation
10 resource acquisitions.

11 Q. In your statement of purpose you said
12 that you would "...provide an engineering opinion as
13 to the appropriateness of the project...". What did
14 you mean by that?

15 A. I meant that in addition to providing an
16 analysis of the cost effectiveness of the project as
17 proposed by IPCo, I would provide an engineering
18 opinion relative to the IPCo proposal being the most
19 cost effective development from the family of reason-
20 ably potential developments at the site -- that is, an
21 opinion as to whether I believe IPCo has provided the
22 most cost effective development practicable for this
23 resource.

24 Q. What is your opinion in this regard?
25

1 A. Before answering that question, I should
2 make two important qualifying points. First, it is
3 much easier to second-guess the quality of a project
4 after someone else has spent the money and labor to
5 develop it than it is to actually do the development.
6 Second, it appears that IPCo has made a substantially
7 greater effort to control costs on this project than
8 on many of its prior power supply developments.

9 Nonetheless, bearing those two caveats
10 in mind, it does not appear to me that IPCo has made
11 the same level of project optimization effort that one
12 would find in a QF development. The most glaring
13 weakness that I find in the project is in the royalty
14 agreement with the canal companies. Even though the
15 irrigators were faced with mandatory dam repairs and a
16 hydro electric project that could not be made cost
17 effective under avoided cost rates extant at the time,
18 the final royalty agreement not only assures the canal
19 companies that they will recover all of their costs of
20 implementing dam repairs, it also assures them of a
21 substantial profit on their investment. This is hardly
22 the result one would expect from a QF developer's
23 negotiations. In fact, I expect that the irrigators
24 would have ended up with only partial reimbursement
25

1 for their dam costs, not a profit, if dealing with a
2 QF developer.

3 Next, it appears that the Milner Plant
4 has been over-sized for the flows at the site. The
5 overall average capacity factor of the project is less
6 than 36% and the average estimated capacity factor in
7 the most productive month (December) is less than 60%.
8 The standard in the industry is typically for overall
9 capacity factors of between 45% and 65%. In general,
10 cost effectiveness improves as capacity factors
11 increase, up to about 65%.

12 Finally, it appears that IPCo used the
13 standard firm bid process to procure equipment and
14 construction services, rather than the more cost
15 effective request for proposals (RFP) and negotiation
16 process. Although the bidding method is immune to
17 administrative challenge because it appears to result
18 in supplier competition, my experience has been that
19 it actually stifles competition and results in higher
20 costs; especially on large, complex projects such as
21 the Milner Plant.

22 There are several reasons for this.
23 Foremost among them is that in preparing requests for
24 bids the design engineer is constrained to "guessing"
25 about the best combinations of size, arrangement, and

1 timing, with minimal input from suppliers; whereas in
2 competitively negotiated contracts based on RFPs the
3 suppliers are challenged to provide their most innova-
4 tive combinations with fruitful give-and-take discus-
5 sions between supplier(s), the owner, and the engineer.
6 In my experience, this method almost always results in
7 better projects at lower cost. Furthermore, it reduces
8 the probability of suppliers receiving cost over-run
9 payments for extra work, unexpected conditions, and
10 ambiguous contract language being construed against
11 the owner (the risk of over-run payments is reduced in
12 this case because the contract is drafted jointly by
13 all parties, not just the owner).

14 Q. Is the entire royalty agreement between
15 IPCo and the irrigators disadvantageous to IPCo and
16 its ratepayers?

17 A. No. The royalty agreement has two
18 components, a base royalty and an incentive royalty.
19 The base royalty assures the irrigators of recovering
20 nearly all of the costs of constructing the dam
21 modifications -- this is the part of the royalty I
22 consider to be excessive. The incentive royalty, on
23 the other hand, is very beneficial to ratepayers.

24 Q. Why is the incentive royalty beneficial
25 to ratepayers?

1 A. Because it provides the irrigators with
2 a strong financial incentive to limit their water use
3 during good water years, and even provides some
4 incentive for irrigation efficiency during moderate
5 water years. I base this opinion on the secondary
6 value of the water that will pass through the turbines
7 at Milner. All water above mean flow conditions that
8 passes through the Milner turbines will probably also
9 pass through each of IPCo's other Snake River hydro
10 plants, except American Falls, which is upstream of
11 Milner. Although I have not quantified this value, it
12 will be substantial -- far in excess of the incentive
13 royalty cost.

14 Q. Do you propose that project costs should
15 be disallowed for ratemaking purposes because you
16 believe IPCo has not optimized its Milner resource?

17 A. No. My speculative criticisms do not
18 provide **evidence** of imprudent management. I merely
19 include this part of my testimony to provide support
20 for the position that IPCo should be held to the
21 standard of avoided cost in determining the ratemaking
22 allowability of new resource costs, and should be
23 required to fully justify its design and construction
24 decisions prior to such costs being allowed for rate
25 making purposes. Clearly the Milner Plant could not

1 be developed as proposed by IPCo if its costs had to
2 be recovered under a QF contract, even under the rates
3 included in Order No. 23357 (which IPCo claims are too
4 high). Furthermore, it is my professional opinion
5 that the Milner site could have been developed under
6 the 23357 rates by a QF developer, albeit only after
7 hard-nosed negotiations with irrigators and suppliers.

8 However, because it would be nearly
9 impossible to provide evidence to prove that IPCo had
10 not provided the optimum development for the resource,
11 the Commission is limited to using avoided cost as the
12 imputed surrogate for identifying prudent decision
13 making. The utility is perfectly able to determine
14 how its proposed projects stack up against comparable
15 avoided costs and it is perfectly capable of estimat-
16 ing the risks that its cost estimates may be low, so
17 it should be held accountable for keeping its costs
18 below those comparable avoided costs. Ratepayers
19 should not be held at risk for utility executives'
20 poor decision making beyond what has clearly been
21 established as achievable costs -- in fact costs the
22 utility claims are excessive (i.e., avoided cost).
23 It's bad enough that it is impossible to identify and
24 reject sub-optimal features that cause excess costs
25 below avoided costs.

1 Q. What are your recommendations in this
2 case?

3 A. I recommend that, based on the estimate
4 that the Milner Project (as proposed by IPCo) will
5 provide energy at approximately avoided costs, the
6 Commission grant a Certificate for the present Public
7 Convenience and Necessity for the Milner Hydro Electric
8 Plant, with the specific caveat that costs in excess
9 of the appropriate comparable avoided cost rate (to be
10 determined in a future rate making case) are, by
11 definition, imprudently incurred. I further recommend
12 that the Commission advise IPCo that this Certificate
13 in no way implies that all costs incurred in develop-
14 ing the project are inherently prudent, but that the
15 Commission will review all costs so incurred at a
16 later date and will determine at that time whether
17 IPCo's execution of the project was prudent in light
18 of the generally accepted standards of the hydro
19 electric construction industry.

20 Q. Did you consider IPCo's suggestion that
21 the Milner Project not be included in rate base until
22 after it had operated for a 20-year period as an
23 unregulated resource ("20-year deferral" proposal)?

24 A. Yes, but I rejected the suggestion
25 because I estimate project costs to be approximately

1 equal to avoided costs.

2 Q. If the estimated project costs are
3 determined to be greater than avoided costs will you
4 recommend that IPCo's suggestion be accepted?

5 A. Maybe. However, that proposal presents
6 several difficult problems and risks. I believe it
7 would be extremely difficult to establish a completely
8 independent non-regulated subsidiary with clear
9 controls to assure that there can be no cross subsidi-
10 zation between that company and the regulated utility.
11 Please note that a major factor in the difference
12 between IPCo's cost estimate for the Milner Plant
13 (\$52.93/MWh) and mine (\$62.73/MWh) is the difference
14 between IPCo's O&M cost estimate (\$272,217/yr) and
15 mine (\$815,780/yr). If the Commission sets up a
16 situation where IPCo is forced to recover its costs by
17 marketing the output of Milner in the competitive
18 wholesale market, there will be extremely strong
19 incentives for IPCo to allocate O&M costs actually
20 incurred in support of Milner to other accounts.
21 Although O&M costs would be fairly easy to audit,
22 Staff witness Miller includes in her testimony other
23 sound arguments against accepting without modification
24 IPCo's "20-year deferral" proposal.
25

