

Nuclear Buzz

The Shill Is Now On the Other Foot

By *Andrea Jenetta, Publisher*

Another week, another U.S. plant shutdown.

I absitively support the decision by Pacific Gas & Electric to shut down Diablo Canyon. Which is not to say that it makes me or anyone else in the global nuclear industry or Uraniumland happy.

If you read the article Rod and I wrote on p. 1, you'll understand in less than a nanosecond that it's the only call the utility as a publicly traded company could have made.

What's more, when the plan fails, if it's the least bit savvy PG&E should be able to position itself so as to be absolved of any and all blame.

I mean, the antis and California lawmakers are the perpetrators in that scenario. All the utility did was follow the law, as CEO Tom Earley pointed out on Tuesday.

"We've got a state policy in place. Given the current state policies, this is the best solution for us." That's right: you can't fight city hall. And in this case, the cost to do so would be astronomical.

The price tag for all the BS seismic studies now required post-Fukushima and going mano a mano with the Nuclear Regulatory Commission, Sacramento and antis just to get the obviously safe plant site relicensed just isn't worth the hassle.

Cal. Renewables Mandates Force Diablo Canyon Closure Under Plan Backed by Antis

By *Rod Adams and Andrea Jenetta*

Diablo Canyon on Tuesday joined the growing list of U.S. reactors to be prematurely shutdown as Pacific Gas & Electric (NYSE:PCG) announced a closure plan negotiated with a veritable who's who of anti-nuclear groups captured in a joint proposal that will be filed with California regulators for approval.

If that joint proposal is accepted by the state's Public Utilities Commission, PG&E will withdraw, with prejudice, the twin-unit plant's operating license renewal application it submitted to the U.S. Nuclear Regulatory Commission in 2009.

Agency spokesman Scott Burnell explained the "with prejudice" phrase. "If applicants submit correspondence to the NRC using that term, the NRC expects that they would not resubmit the same application at a later date," said Burrell.

But he declined to speculate whether the legal term would be binding to a new plant owner, saying it contained too many variables to answer. Without the renewal, the operating licenses for Diablo Canyon's two reactors, which annually generate 16,000-18,000 GWh, 20% of PG&E's generating capacity and 9% of California's electricity, will expire in 2024 and 2025.

The deal to stop the renewal was negotiated by PG&E with the Natural Resources Defense Council (NRDC), Friends of the Earth (FOE), International Brotherhood of Electrical Workers Local 1245 (IBEW-1245), Alliance for Nuclear Responsibility, Coalition of California Utility Employees and Environment California.

The utility put relicensing efforts on hold in 2011 after Fukushima to study the earthquake faults surrounding the plant. According to the joint proposal PG&E has spent \$50 million to get approval to run both reactors an additional 20 years.

see Cal. Renewables Mandates on page 6

More Inside

Namibia Ready to Ink Export Deal with India

See page 3

As for whether the grand experiment will succeed, well, I think it's going to cost a lot more than anyone thinks, especially the idiot antis who really believe that renewables will replace the 17,000 GWh that Diablo Canyon generates every year.

Nevertheless, as I said when Germany embarked on its “we’d rather kill people with dirty coal than give up our ideological hatred of all things nuclear” Energiewende program, if anyone can pull it off it’s California.

The state is incredibly wealthy: according to the interweb its Q2 2015 GDP of \$2.4 trillion ranked first among all U.S. states and just above sixth placed France among the world’s 188 countries.

That GHG emissions will increase in the process as they have in Germany while unreliables fail to reach nameplate capacity and are backed by “clean” natural gas is clearly besides the point for these people.

Since you might find yourself more than a little depressed that yet another U.S. nuclear plant is going to close, here’s a little cheer in the form of a bona fide smoking gun.


The Natural Resources Defense Council has. Multiple. Conflicts. Of interest. Hah!

Check out this [entertaining, actually researched piece](#) by everyone’s favorite former anti-turned-pro-nuclear proselytizer Michael Shellenberger, president of Environmental Progress, founder of The Breakthrough Institute and star of Pandora’s Promise.

Shellenberger writes that the two highest-ranking members of NRDC’s board of trustees, its chair and vice chair, as well as one of NRDC’s single largest donors, are all major investors in natural gas and renewables companies that could benefit significantly from Diablo’s closure.

Its board chairman is vice president at AECOM, one of the world’s largest developers of natural gas power plants and pipelines. One of NRDC’s vice chairs, Max Stone, is a managing partner at D.E. Shaw, an investment firm that on June 16 [bought a solar farm](#) in California that has a power purchase agreement with PG&E.

D.E. Shaw has large investments in natural gas, solar, wind and

		Uranium Prices	
		Term: July 2016 cob June 23, 2016	
		BID	OFFER
U3O8 (physical)		\$26.00	\$26.75
U3O8 (financial)		\$26.00	\$26.75
UF6 (physical)		\$74.75	\$76.75

Source: Evolution Markets Inc. +1 914.323.0252
www.evomarkets.com [Disclaimer](#)

efficiency companies, reported to have \$37 billion in investments and a portfolio of 23 wind and solar projects whose capacity totals 1,100 MW.

One of NRDC’s largest donors is [Nat Simons](#), an investor in solar, wind, biofuels and other renewable energy companies.

He contributed almost \$15 million to NRDC from 2009 to 2013 and specified that the donations be used to change energy and climate policies.

Shellenberger has plenty of other examples of NRDC’s conflicts of interest.

Now am I *really* bothered or shocked by all of the above? Not at all. COIs exist. I don’t think I’m telling a dirty little secret that Uraniumland is rife—*rife*—with those conflicts.

All that matters here is how the public perceives the accusation—and that we nuclear shills get to accuse those who’ve accused of us being nuclear shills of being fossil fuel shills. I did that on the Twitter today and boy was it fun.

Finally, as you may recall, in last week’s issue there was a contest of sorts, my way of seeing who out there in Uraniumland is paying attention and following the clues.

Winners include Steve Nesbitt, Jim Malone, Ron Witzel, Theann Santos and Dave Talbot who, in telling me that a certain [Iron Maiden record](#) was one of his favorites back in the day, made me realize he is not your typical uranium investment analyst.

Enjoy your 15 minutes. ●

Namibia Ready for Uranium Export Deal with New Delhi

By Roger Murray, Global Correspondent

Namibia is set to join the increasing number of uranium producing countries prepared to export yellowcake to India as that country continues to expand its supply sources of nuclear fuel for its ambitious new build nuclear program.

This was the main outcome of a three-day state visit to Namibia last week by India's President Pranab Mukherjee.

At a Windhoek state banquet on June 17, the last day of Mukherjee's visit, Namibia's President Hage Geingob said, "We will look into legal ways wherein our uranium can be used by India" for peaceful purposes.

India was also invited to invest in the mining and exploration of uranium and other minerals.

However, since most areas prospective for yellowcake, mainly in the central Namibia desert, are already licensed out to developers such as Bannerman Resources (ASX:BAN), Deep Yellow (ASX:DYL) and Forsys Metals (TSX:FSY), it is not clear how this would be achieved in practice.

There are almost no private Indian companies with resources or expertise in the uranium sector, although diamonds and base metals are another matter.

Proliferation Safeguards Will Be Required

The Indian press was enthusiastic about Geingob's announcement, which effectively opens the door to Namibian uranium exports to India. But a detailed bilateral agreement enabling yellowcake exports to take place will have to be drafted and approved by Namibia's National Assembly.

This will need to contain safeguards to ensure the uranium supplied is only used for the legitimate purpose of civil nuclear power generation, as with the India-Australia supply agreement of November 2015.

Namibia had in fact initialed a uranium export agreement with India in 2009, but this remained dormant due to Namibia being a signatory of the nuclear-non-proliferation treaty (NPT), while New Delhi is not.

However, India has concluded uranium supply agreements with a growing list of countries, including France, the U.S. and Canada, following a safeguards agreement signed with the IAEA in 2008 and the 45-member Nuclear Supplier's Group (NSG) exemption of India from rules prohibiting trade with non-NPT signatories. But specific bilateral safeguard arrangements are still required for uranium exports.

A formal Namibia-India export law will likely replicate the India-Australia agreement, which includes non-proliferation safeguards. This is likely to take up to a year at least, given the initial Australia-India export deal was initially signed in September 2014.

India is sending a technical team to Namibia later this year to discuss the modalities for a formal export agreement. This will find Namibia has considerable institutional capacity on its side.

This includes an Atomic Energy Board (AEB) and the Namibian Uranium Association (NUA) of the Chamber of Mines of Namibia (CMN), which acts as the advocacy body on behalf of local uranium mining and exploration firms.

The AEB's mandate includes a commitment to make radiation safety, non-proliferation and transparency its highest priority. The Atomic Energy and Radiation Protection Act of 2005 provides for the control and regulation of the production, processing, handling, use, holding, storage, transport and disposal of radiation sources and radioactive materials.

Husab Most Likely Supplier

Namibia is currently the fifth largest yellowcake producer, after Kazakhstan, Canada, Australia and Niger, and is set to become second biggest from 2017, with planned production of 6,800 tonnes of uranium oxide per year from the Chinese-owned Husab mine.

This will more than treble production from the existing Langer Heinrich and Rössing mines so there will be more than sufficient capacity to supply India.

Due to the weak uranium market, Rössing has more than halved production compared to five years ago, and is currently only producing the yellowcake it needs to meet existing delivery commitments.

Most Langer Heinrich output, too, is on an existing contract delivery basis, including a large forward supply contract with Électricité de France.

While a major proportion of Husab's output will be sold to China, the intention is also to sell some production on the spot market or via supply contracts. This makes it probable that Husab would be the first Namibian producer to conclude a commercial supply contract with India.

Cameco signed its first supply contract with India this April,

over two years after Canada and India signed a bilateral nuclear cooperation agreement in September 2013.

While China is set to be Namibia's major yellowcake export market, the substantial expansion in production that Husab will generate means there should be more than sufficient capacity to supply India also. ●

After Third Resource Upgrade Honeymoon Now at 58Mlbs

By Roger Murray and Andrea Jenetta

The Honeymoon resource has increased by 5.2 million pounds (2,359 tonne) U3O8, the third substantial upgrade for the project since Boss Resources (ASX:BOE) acquired it from Uranium One last December.

The base metals focused company has also begun an expansion study aimed at reducing operating costs at the mine through larger volumes, with results due in August.

This week Boss announced that the ongoing test work program supporting that study has shown positive results for the use of an ion exchange flowsheet.

The pounds come as a maiden inferred resource for the Jason deposit, located at the northern end of the Yarrambeek paleochannel, host to the 27.6 million pound (12,519 tonne) Honeymoon deposit.

The JORC 2012-compliant Jason resource estimate grades an average 840 ppm (0.08%) eU3O8 above a 250 ppm cut-off, and was based on an extensive review of the historical drill hole data base.

The total resource inventory for the Honeymoon project area, including both Honeymoon and Gould's Dam, has now increased to 40.1 million tonnes of ore grading 654 ppm (0.07%) eU3O8, for 57.8 million pounds (26,218 tonnes) of contained yellowcake.

Of this, 17.1 million pounds (7,756 tonnes) U3O8 are measured and indicated and 40.7 million pounds (18,461 tonnes) inferred.

The total resource is now 3.5 times greater than when Boss acquired Honeymoon for A\$9 million in staged payments under a year ago.

An exploration target for Jason has been estimated at 3 million to 6 million tonnes of ore, grading 700-800 ppm eU3O8 for 5 million to 20 million pounds (2,268-9,072 tonnes) of contained yellowcake.

A program is planned for the September quarter, focused on the potential for future increases through extensional and infill drilling.

The 2,600 square kilometer area includes the Honeymoon mining lease, making it one of four fully-permitted projects at present in Australia. The mine has been on care-and-maintenance since 2013.

Boss recently raised A\$1.25 million (\$900,000 million) through the placement of 31 million shares, in which one institutional fund manager subscribed to 40% of the shares on offer.

Honeymoon is one of the highest grade un-mined uranium resources in Australia, and one of four fully permitted.

Proactive Investors commented on June 14: "Given the time it takes to attain permits, this theoretically places them 3-5 years ahead of peers. The project has A\$170 million (\$126 million) worth of plant and infrastructure already in place."

Expansion Study Underway

The Honeymoon expansion study is focused on evaluating three technology/process options to optimize and reduce costs for the planned expansion and minimize start-up issues for the processing plant:

- Optimize and expand the current solvent extraction plant in the near term, with an expansion to include satellite resin plants in the future when the remote satellite deposits come on line.
- Implement a combined ion exchange (resin) and solvent exchange process, with the resins upgrading the solutions prior to solvent extraction purification. Expansion will be based on satellite resin plants.
- Implement an ion exchange only process. Expansion will again be based on satellite resin plants.

One of the methods will be selected as the “go-forward” case and advanced so that the scope for a prefeasibility study (PFS) can be accurately defined, Boss said. GR Engineering has started the design work and preliminary results are expected by the end of June.

The decision about the expansion’s size will form part of the PFS, but for this initial work GR Engineering is assuming an annual production rate of 2 million pounds U3O8, ramping up to 3.5 million pounds.

Boss has identified that a larger processing plant facility, possibly incorporating the use of resin technologies, could significantly reduce the cost of production. The results from the expansion study are on schedule for delivery in the third quarter, 2016.

“We are encouraged by the positive results received from the initial stages of the resin technology test work program at Honeymoon,” said Executive Director Grant Davey.

Testing of two resins to date have confirmed the selectivity and high loading capacity of the weak based anion resins in the presence of high chloride levels and significant iron concentrations.

Resin loading and elution tests, along with modeling of the proposed circuits, have been completed and the results are being used as inputs for the expansion study.

They indicate that high recoveries can be achieved at high resin loadings, assuming an increased number of operating resin columns.

Preliminary work is positive as it indicates that to achieve >95% recovery at roughly 8g/l loading, a minimum of seven columns would be required.

The company anticipates that preliminary engineering designs will be ready this month. ●

FCW EXCLUSIVE

NECG: Only USG Can Repair Market Failure, Preserve NPPs

By Andrea Jenetta, Publisher

Only the U.S. federal government can fix market failure in the nuclear power industry caused by private ownership of nuclear power plants that get no compensation for the substantial public benefits they provide.

That’s the conclusion of a Market Failure and Nuclear Power, new study written by Ed Kee, CEO and principal consultant at Nuclear Economics Consulting Group (NECG), that will be publicly released on Friday, June 24.

In an innovative solution, Kee proposes a “Plan A” for nuclear similar to the one for coal plants that was presented as an alternative to the stalled Clean Power Plan.

Under that concept, the federal government would buy coal plants in order to shut them down, an approach that NECG says would be faster, more certain and more legally defensible than the CPP, in the process achieving the plan’s goals and helping the U.S. meet its COP21 carbon emission reduction commitments.

Likewise, in a Plan A for nuclear, the federal government would

buy existing nuclear power plants to keep them in operation, with the government taking the operating losses of nuclear power plants during periods of low electricity market prices.

Providing direct compensation for nuclear’s public benefits through power contracts, clean energy mandates and tax credits get at the heart of market failure, argues Kee, and related costs can be justified by the same market failure arguments that have worked for renewable generation.

The bottom line, according to NECG, is this: If we recognize that the market will not build renewable generation despite benefits to society—no carbon or other air pollution emissions—and take actions to overcome this market failure, we should do the same for nuclear power.

Kee will give a presentation on the study on June 28 at the Global America Business Institute in Washington, D.C.

Nuclear power economics expert Edward Kee provides strategic and economic advice to companies and governments on nuclear power and electricity industry issues. Before starting NECG, Kee held senior consulting positions at NERA Economic Consulting, CRA International and PA Consulting Group. In a previous life, he was a merchant power plant developer and a nuclear power plant engineer before becoming a consultant. Kee holds an MBA from Harvard University and a B.S. in Systems Engineering from the U.S. Naval Academy.

continued from Cal. Renewables Mandates on page 1

As clarified during a Tuesday press conference, there were no state or federal agencies, or any consumer group representatives, involved in the bargaining process.

Bloody Land Lease Fight Anticipated

One issue affecting the timing of the announced deal was the near-term need for lease extensions for state-owned tidelands occupied by the plant's cooling water structures.

Those 49-year leases expire before Diablo Canyon's licenses expire because the construction project took 15 years instead of the allotted nine.

Without an extension the state had a legal hammer with which to force units to stop running in 2018 and 2019. Normally, continuing already existing uses of similar leased land is a routine, non-contentious matter.

Lt. Gov. Gavin Newsom (D), former mayor of San Francisco who is now running for governor, is a Diablo Canyon opponent.

"I just don't see that this plant is going to survive beyond 2024, 2025," Newsom told the Cal Coast News in January. "I just don't see that. Now, I absolutely may be wrong, but that's my punditry. And there is a compelling argument as to why it shouldn't."

Several of the parties involved in the closure deal had been actively pressuring the state to use the leases as a way to extract new commitments from PG&E.

But under the joint proposal, the parties agreed to write a joint letter to the California Lands Commission to express support for the extensions to match up with current operating licenses without environmental reviews.

During the press conference Friends of the Earth official Erich Pica said that the letter has already been sent and expressed confidence that the recommendation will be accepted by the commission, which is scheduled to discuss the matter on June 28.

Mothers for Nuclear, Environmental Progress, Thorium Energy Alliance, Energy for Humanity, Pandora's Promise and Californians for Green Nuclear Power have said they would attend that meeting to support the extension.

They have also organized a four-day March for Environmental Hope! that arrives in Sacramento in time to sign up for the meeting comment period.

In response to the private party deal, Environmental Progress and Mothers for Nuclear issued a press release that said, in part, "The back-room Diablo Canyon deal—negotiated by corrupt institutions behaving unethically and perhaps illegally—will fail...."

"It will fail because when people understand that the proposal is based on a big lie—that Diablo can be closed without increasing fossil fuel use, methane emissions and carbon emissions—they will reject it, and the leadership of the institutions who negotiated it."

Robert Stone, the director of Pandora's Promise, said, "It's a mathematical certainty that closing nuclear plants results in more fossil fuel burning and emissions."

50% RPS Excludes Nuclear

Tony Earley, CEO of Pacific Gas & Electric, clarified during Tuesday's press conference that SB350, a state law enacted last October, is the driving force behind the company's decision to sit down with a group of parties with whom it has been in conflict for years.

"Last year, when SB350 was being developed, our going-in position was instead of a renewable standard it should be a greenhouse gas free standard," he said. "We actually do believe that we could have had a lower cost strategy that way. And that we would have been using nuclear. But that argument didn't prevail and we've got a state policy in place. Given the current state policies, this is the best solution for us."

The law mandated an increase in the share of electricity from qualified renewable sources to 50% and a doubling of energy efficiency savings in electricity and natural gas end use by 2030.

As a result, Earley explained, PG&E would be able to use less and less electricity from Diablo Canyon as it took additional action to achieve its portion of the target, leaving the plant operating at a capacity factor of about 50%.

Since virtually all of the cost of owning and operating the facility is fixed, reducing output would increase the cost for each remaining kilowatt-hour, doubling the cost of its electricity even before any other cost increases due to inflation, seismic requirements or cooling water regulations.

When compared to that new cost, renewables and energy efficiency investments appear to be cost competitive, Earley told reporters.

“The reality is that as we looked at the usage of Diablo Canyon going forward, its capacity factor is going to fall, but since most of its costs are fixed, as you get down, let’s just take a number. As the capacity factor drops to 50%, that effectively doubles the cost per kilowatt-hour.

“And then you calculate the cost of the whole package including the renewable energy and all of the other provisions, our conclusion is that it’s going to cost less overall as a total package than if you just continued to operate Diablo Canyon going forward—under the assumption that it’s going to operate less under the energy policies that are in place.”

As additional contributing factors to the shutdown decision PG&E cited the challenge of managing overgeneration and intermittency conditions under a resource portfolio increasingly influenced by solar and wind production, the growth rate of distributed energy resources, and the potential increases in the departure of PG&E’s retail load customers to Community Choice Aggregation.

Replacement Costs Are Unknown

The agreement specifies three “tranches” of procurements. The first two, one for 2,000 GWh of energy efficiency and a second for another 2,000 from greenhouse gas free resources through an all-source solicitation, will provide a total of 4,000 GWh per year by 2031.

The third calls for PG&E to buy “incremental RPS eligible resources through competitive solicitations to voluntarily achieve a 55% RPS,” 5% higher than the state mandate. The utility will keep the 55% commitment through 2045.

When Lauren Sommer from KQED asked for some math help to understand how the targets replace the 17,000 GWh produced by Diablo Canyon, PG&E president Geisha Williams volunteered to explain.

“You have to remember that we don’t really believe that we need full output of Diablo,” Williams said. “That’s part of the whole use case that Tony mentioned earlier, that whole capacity factor being somewhere around 50%. So there’s not a need to replace the full output of Diablo because you don’t need it.

“There’s been so much energy efficiency, there’s been so much power being generated by customers using their own private solar rooftops as well as community choice aggregation, so when we look at the net need it’s much, much less than the 16,000 (GWh), which, by the way is the number from Diablo today,”

PG&E representatives deflected even ballpark cost questions on several occasions. Jim Polson of Bloomberg News pressed that issue with the last question. “You’re wanting cost recovery for this. How much will that be?”

“I have a couple of numbers,” said Williams. “For example, we’re estimating about \$350 million that’s going to be associated with workforce retention, training and redevelopment costs associated with keeping our qualified workforce in place so that they can continue to operate the plant safely.

“We talked about the \$50 million associated with the community of San Luis Obispo. But the remaining costs are really all about replacement power costs. And that is to be determined, depending on what types of procurement power costs we might actually end up doing.”

One of the reasons for the lack of clear costs is that the joint proposal, which will be filed with California regulators within 60 days and possibly okayed by the end of 2017, is just the first step in the process to close Diablo Canyon, most of which depends on public utility commission decisions.

For example, it will need to approve specific plans to replace the plant’s output using the three procurement tranches.

As the utility noted in a written statement, “Any resource procurement PG&E makes will be subject to a non-bypassable cost allocation mechanism that ensures all users of PG&E’s grid pay a fair share of the costs.”

PG&E said it will also ask regulators to confirm that its investment in Diablo Canyon will be recovered by the time the plant closes, including the \$1 billion needed in funds to reach the projected \$3.8 billion price tag for decommissioning, and allow the recovery of the costs for employee and community transition actions.

That means it will be up to the state to decide how much ratepayers will pay to buy replacement power and amortize PG&E’s investment in building Diablo Canyon.

Bloomberg Estimate: At Least \$15B

According to Bloomberg Intelligence analysts, the closure plan would cost \$15 billion if all its output is replaced with solar-generated electricity at current prices.

Actual costs could be lower because the company expects to account for reduced demand and replace only part of the plant’s

production, energy policy analyst Rob Barnett said in a June 22 interview.

California's goal to get half its power from carbon-free sources by 2030 will be challenging without nuclear, although few states can match the wind and solar resources of California, said Kit Konolige, co-author of the analysis.

"If you were to take all the energy from Diablo Canyon and say, 'I want to replace that with solar,' this is an estimate of that investment," Barnett said.

Diablo Canyon's two reactors account for 20% of annual power production in PG&E's territory, according to the utility owner's agreement to shut the plant.

Based on current prices and generating capacity for solar power, the company would need 10,500 MW of new solar installations to replace all of Diablo Canyon's output, the research concluded.

"Gas-power plants will probably be needed for backup when wind and solar plants aren't available," Barnett and Konolige wrote.

"Greater use of natural gas may make California's emission goals more challenging to meet."

The \$15 billion Bloomberg Intelligence estimate excludes decommissioning costs, new transmission lines, back-up resources for solar or potential tax credits from renewable energy investments. ●

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