



Three bulleted references below document the risks associated with retiring safe, economical, and reliable fuel-secure and emission-free nuclear power plants and replacing them with natural gas, a "just in time" fuel. New York State, which was at one time a leader in nuclear power, is in the process of replacing their clean nuclear power plants with highly-polluting "dual fuel"

power plants that burn fuel oil or other liquid hydrocarbons during the inevitable natural gas supply constraint events. Such a change could be in store for the remainder of the nation - hidden behind the fossil industry's deep-pocketed advocacy for solar and wind. See the August 8, 2016 *Washington Post* "Turns Out Wind and Solar Have a Secret Friend : Natural Gas." <http://tinyurl.com/Natural-Gas-Secret> Contact Gene Nelson, Ph.D., CGNP Legal Assistant at (805) 363 - 4697 or Government [at] CGNP dot org for details.

- This 2015 U.S. Department of Energy - funded reference is an excellent introduction to transmission and generation planning processes. (NERC Planning processes need to incorporate probabilistic risk analysis [PRA] into the appropriate reliability standards. The NRC is already incorporating PRA into its nuclear power generation regulations.) **A White Paper on the Incorporation of Risk Analysis into Planning Processes** - NARUC - EISPC - EPRI - January 2015 159 Pages.

<https://pubs.naruc.org/pub.cfm?id=536DCF19-2354-D714-5117-47F9BA06F062>

477 instances of "Reliability" 6 instances of "NERC Reliability" Page 4, Page 33 (Section,) Page 116 (**Current standards are deterministic,**) Page 144, Page 156 - **Software tools for Deterministic Analysis**, 7 instances of "Nuclear." Page 28 with Loss of Load Expectation (LOLE,) i.e. Blackouts. Page 31 (Long nuclear planning process.) Nuclear policy Page 41, Nuclear retirements with increasing use of natural gas Page 47, Low-cost gas implies smaller nuclear build out Pages 47-48, 128 instances of NERC, 25 instances of WECC, 10 instances of CAISO. Neither "Earthquake" nor "Seismic" occur. Thus, they are likely excluded from these analysis techniques.

- **"WECC Western Interconnection Gas – Electric Interface Study Public Report,"**

June, 2018 Page 15 Of 30 - Cited in EIPC Gas-Electric Interface Study, below.

<https://www.wecc.org/Administrative/WECC%20Gas-Electric%20Study%20Public%20Report.pdf>

...The **DSW pipeline rupture scenario** results in full disruption of gas service to 24 GW of gas generators, which translates into 428 GWH of unserved energy and 236 GWH of unmet spinning reserves. The impact can be traced back to the configuration of the pipeline system which yields two concentrated "islands" of power demand in Phoenix and Southern California; with the loss of a DSW mainline, there is simply not enough capacity remaining to provide the gas needed to compensate....

To put the above disruption of 24 GW of California's natural-gas-fired generation in perspective, per the California Energy Commission's 2018 statistics,Natural gas-fired power plants make up 41,000 MW (41 GW) or about half of the state's total generating capacity ...Annual natural gas fired production was 90,691 GWH..... Natural gas now provides about 60% of California's dispatchable (always-on) power.

<https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2019-total-system-electric-generation/2018>

- **EIPC Gas-Electric System Interface Study** (EIPC = Eastern Interconnection Planning Collaborative)

David Whiteley, EIPC Executive Director

John P Buechler, Chairman, EIPC Coordination Committee

NERC Workshop: Gas Infrastructure Risk

July 10, 2018

Levitan & Associates

https://www.nerc.com/pa/RAPA/Lists/RAPA/Attachments/310/2018_NERC_Technical_Workshop_Presentations.pdf

21 instances of Nuclear. Implausible nondispatchable substitutions for dispatchable nuclear power shown on page 14. What actually occurs is the substitution of dispatchable natural gas with its associated emissions - and fuel oil during natural gas supply constraint events associated with winter polar vortices or summer heat waves - for reliable, economical, fuel-secure nuclear power. See WECC's "DSW Scenario" on pages 50 and 51. DCPD Retirement discussed without mentioning California-specific foreseeable disruptions to natural gas transmission lines on page 52. See The Analysis Group Presentations on the final pages. 225 pages in report.