Demand Response – Industrial Customer Perspective

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Demand Response

• Definition
  • Purposely shutting down installed manufacturing capacity (load) that otherwise would operate and consume electricity to limit the total grid electrical load for some time period

• Purpose
  • To avoid the construction of a power plant that would only operate a small number of hours per year for a number of projected years yet be a costly additional year round expense to the rate base

• Areas of Contention
  • How much DR capacity exists?
  • How much of the resource capacity should DR be?
  • DR load drop response characteristics?
  • How DR should be dispatched?
  • How DR should be compensated?
Background

• Prior periods
  • 100% regulated markets with electricity rates below $40 per MWh everywhere
  • Planning and rate setting was based on relatively small geographical territories
  • Significant seams existed in the grid
  • Industrial customers could achieve rates below $30 per MWh by agreeing to be “Interruptible”
    » Limited number of summer/winter periods of interruption
    » Limited duration of interruptions (typically 2 to 4 hours per event)

• Current
  • Electricity rates vary widely from $40 to $80 per MWh
  • Minnesota Power industrial rates have increased 35% since 2007 and are projected to increase another 20% by 2018
  • Deregulated markets in some states
  • Capacity planning is largely on a regional scale
  • Ratemaking in regulated markets remains based on relatively small geographical territories
  • Some states have mandatory renewable portfolio standards (RESs)
  • EPA regulations have become quite wide ranging
  • DR and Demand management have replaced “Interruptible” service credits in deregulated markets
Determining DR Participation: Physical Aspects

• Physical load reduction
  • “How many” MW’s of load reduction?
  • Is load reduction measured from operating point just prior to reduction or from the site PLC (Peak Load Contribution) Demand for the delivery year?
  • “How load reduction” occurs?
  • “How long” to reduce load?

• Order fulfillment impact
  • Will a shutdown impact order delivery? If yes, needs to be resolved.
  • Can those orders be shifted to a second plant?
  • Can intermediate product be staged to cover an upstream unit shutdown?

• Production Delay Impacts
  • Quantify extra reject product due to shutdown and start-up (i.e. product cannot be reworked)
  • Quantify any additional process steps to correct out-of-specification product
Determining DR Participation: Financial Aspects

• Determine fixed costs associated with DR curtailment period
• Calculate the cost premium associated with additional rejected product and/or changed product manufacturing sequence option identified in the previous steps
• Calculate the net lost margin a DR reduction causes – this becomes the break even DR revenue that must be received
• Calculate what DR revenue the defined program will yield
  • Program specific – can be a combination of monthly DR capacity payments based on registration MW’s and energy payments per each DR event
  • Does potential DR revenue exceed the estimated cost of DR performance? If, no than DR performance is not viable.
  • If yes, will net gain from DR performance sufficiently reduce the cost of power to warrant acceptance of all DR participation T’s & C’s?
• Quantify what the financial penalties are for failing to deliver DR performance to fully understand the DR risk/reward picture
Determining DR Participation: Performance Management

- Review DR response notification and event performance confirmation requirements
- Determine whether in-house staffing and load metering/data retention is adequate to meet the ongoing DR program requirements
- Determine potential systems issues and whether or not they can cause DR performance issues (company by company review and decision process due to wide range of practices)
- In-house staffing is adequate DR program management
  - Delineate roles and responsibilities between corporate and plant staffs
  - Determine performance tracking metrics
- In-house staffing is not adequate to handle DR program management
  - Evaluate cost/benefit of increasing internal staff
  - Evaluate using a 3rd party CSP (Curtailment Service Provider)
  - Determine what cut of the DR revenue must be shared and whether participation still makes financial sense
ArcelorMittal USA’s DR Experience

• DR has only been done in deregulated markets thus far
  • Select regulated markets have tariffs but they provide insufficient value
  • Where applicable in regulated markets we continue to use traditional Interruptible Demand credit tariff structures (larger benefit)
• Straight DR participation is becoming less valuable than maximum PLC demand reduction as programs now typically require year round DR response or pay significantly less for “Summer Only” response classification
• Rule changes in DR load drop measurement from PLC Demand value instead of from Operating Demand level just prior to reduction reduced DR participation value
• EAFs provide synchronous reserve services – load can be reduced quite rapidly and most events only last a few minutes so any steelmaking heat in process can be resumed without detrimental effects
• Higher order book levels reduce mill willingness to take extra DR curtailments
• Internal company structures can simplify or complicate participation (ours mostly simplifies)
• Participation does not require a lot of people or special software → does require that you understand what drives the costs both for the electric grid and the DR participating mill
• For the most part we operate as our own LSE, RES, and CSP instead of sharing the revenue in Pennsylvania and Ohio with 3rd party providers
• 3rd party CSP’s were used for the Pennsylvania state program that mandated each EDC to reduce its peak demand value → EDC’s contracted with CSP’s and CSP’s contracted with DR participants
Determining DR Participation: Ongoing DR Rulemaking Aspects

- DR Rulemaking never ends
- Generators continually challenge every aspect of every DR program
- DR is many times viewed as a “take away” by Utilities
- There is continuous interplay between FERC, RTOs and PUCs regarding jurisdiction aspects (example being FERC Rule 745 which was challenged in the courts and now is being revised)
- CSPs and Industrial Customers are not necessarily aligned on all aspects of DR
  - CSPs are in the business of selling DR services → “more is better”
  - CSPs are better positioned to aggregate incremental DR response capabilities from many customers to achieve a larger total DR load reduction obligation
- Industrials are in the business of making and selling a physical product and use DR as a tool to help manage power costs → “higher value impact per DR event is better”
Closing Remarks

• All industrial customers should fully evaluate whether DR participation can help to contain power cost escalation
• DR programs should be designed to attract as many industrial customer participants as possible
• Regulators should use DR programs to smooth out power cost peaks caused by building generation capacity too quickly before projected, sustained, load growth materializes
• DR reimbursement rates need to be high enough to reward industrial customers for the operational uncertainty risk that they take on
• Effective DR programs need to be just one part of an effective State plan to achieve sustained reasonable industrial power rates
• Achieving reasonable industrial power rates needs to be just one part of a State plan for sustained economic development

Thank you for the opportunity to provide this input.
ArcelorMittal Operations in the USA

- 4 integrated steel mills each with internal steam and power generation
- 1 BOF and Continuous Strip Caster steel mill
- 7 EAF steel mills
- 6 stand alone finishing mills
- 3 stand alone plate mills
- 2 tubular/pipe mills
- 6 tailored blanks plants
- 2 iron ore mines
- 1 coal mine
- 2 stand alone coke batteries

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