

## IMPLEMENTATION WORK GROUP

**June 16, 2000  
0830-1530**

**Kingstad Center  
Portland, OR**

**Meeting Minutes  
Version 1 – June 20, 2000**

### Attendees:

Jack	Bernhardsen	Pacific NW Security Coordinator	360-418-2956	jackbernhardsen@home.com
John	Boucher	KEMA Consulting	503-258-0182	<a href="mailto:jboucher@kemaconsulting.com">jboucher@kemaconsulting.com</a>
Carolyn	Cowan	Sierra Pacific & Nevada Power	775-834-4180	ccowan@sppc.com
Christine	Elliott	Northwest Power Pool	503-464-2804	chris@nwpp.org
Mike	Ferguson	U S Bureau of Reclamation	406-247-7325	mferguson@gp.usbr.gov
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David	James	Avista Corp	509-495-4185	djames@avistacorp.com
Jon	Kaake	PacifiCorp	503-813-5734	jon.kaake@pacificcorp.com
Ray	Nelson	PRM	425-451-9123	rnelson@prmlp.com
Rick	Paschall	Pacific NW Generating Coop	503-288-4870	rpaschall@pngc.com
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Norm	Stanley	PacifiCorp	503-251-5155	norm.stanley@pacificcorp.com
Ralph	Underwood	Seattle City Light	206-706-0240	ralph.underwood@ci.seattle.wa.us
Jim	Vinson	BPA/TBL	360-418-2011	javinson@bpa.gov
Don	Watkins	BPA/TBL	360-418-2344	dsWatkins@bpa.gov
Gary	Wright	Sierra Pacific Power	775-834-3282	gwright@sppc.com

### Calendar:

May 23, 2000	0830 - 1230	Work Group Meeting	Kingstad Center	✓
June 1, 2000	0830 - 1700	Work Group Meeting	Kingstad Center	✓
June 2, 2000	0830 - 1530	Work Group Meeting	Kingstad Center	✓
June 9, 2000	0830 - 1530	Work Group Meeting	Ditmer Control Center	✓
June 16, 2000	0830 - 1530	Work Group Meeting	Kingstad Center	✓
June 22, 2000	0830 - 1700	Work Group Meeting	Kingstad Center	
June 23, 2000	0830 - 1530	Work Group Meeting	PDX Center	
July 14, 2000	0830 - 1530	Work Group Meeting	Kingstad Center	
July 21, 2000	0830 - 1530	Work Group Meeting	Kingstad Center	
July 28, 2000	0830 - 1530	Work Group Meeting	Kingstad Center	
August 4, 2000	0830 - 1530	Work Group Meeting	Kingstad Center	
August 11, 2000	0830 - 1530	Work Group Meeting	Kingstad Center	
August 18, 2000	0830 - 1530	Work Group Meeting	Kingstad Center	

**Assignments:**

<b>Action Item</b>	<b>Responsible Parties</b>	<b>Status</b>
Update consensus assumptions list to cover all FERC 2000 characteristics and functions	John Boucher	Due 6/22/2000
Provide spreadsheet of ancillary services operational responsibilities to AS WG	Mike Ryan	Due 6/22/2000
Define issues concerning AGC hierarchical operation including identifying responsible work groups and clarifying the questions going to these groups. Recommend answers to issues assigned to the Implementation work group.	Bob Harshbarger (lead), Deanna Phillips, Mike Ryan, Don Watkins	Due 6/22/2000
Define issues concerning metering including identifying responsible work groups. Review IndeGO meter specifications, compare with Desert Star and update as required.	Ralph Underwood (lead), LeRoy Patterson, Vern Porter, Don Watkins	Due 6/22/2000
Define issues concerning technology requirements including identifying responsible work groups and clarifying the questions going to these groups. Recommend answers to issues assigned to the Implementation work group.	Don Watkins (lead), Bob Harshbarger, Dave Perrino, Mike Ryan	Due 6/22/2000
Define issues concerning organization and staffing including identifying responsible work groups and clarifying the questions going to these groups. Recommend answers to issues assigned to the Implementation work group.	Richard Goddard (lead), Jack Bernhardsen, Chris Elliott, John McGhee, Chris Reese	Due 6/22/2000
Create generic RTO organization chart for MISO and ERCOT to insert staffing levels. Fill in NYISO staffing figures.	Richard Goddard (lead), Jack Bernhardsen, Chris Elliott, John McGhee, Chris Reese	Due 6/22/2000
Complete assessment questionnaire for Avista, PGE, and BPA	David James (lead), Douglas Cave, Jon Fisker, Norm Stanley, Jim Vinson	Avista and PGE Portland Completed
Provide a 30 minute overview of IndeGO operations and staffing, including driving forces and short-falls.	LeRoy Patterson, Jon Kaake	Due 6/22/2000
Complete assessment questionnaire for remaining candidate centers	David James (lead), Douglas Cave, Jon Fisker, Norm Stanley, Jim Vinson	Due 6/22/2000
Define criteria for back-up control center. What, if any, RTO functions does it perform on a daily basis? Is it a full or a partial back-up (what functions?)?	David James (lead), Douglas Cave, Jon Fisker, Norm Stanley, Jim Vinson	Due 6/22/2000
Establish joint operations planning team with Transmission Planning work group	LeRoy Patterson, Chris Reese, Don Watkins	Due 6/22/2000

Create draft agendas for conference calls with MISO and ERCOT	John Boucher	Due 6/22/2000
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**Summary of Consensus:**

1. Since at least one control area operator will relinquish its control area status, the RTO must operate a control area. Some existing control area operators will remain in place.
2. Specific generator operation within a plant or project, such as hydro optimization, will be executed at the local level not at the RTO level.
3. Note that in any case where consensus is reached that later proves inconsistent with decisions made by work groups responsible for a specific policy, such as Ancillary Services, then the Implementation work group will bring its consensus into conformance with those decisions.

**Highlights of Meeting by Agenda Item (Agenda Attached)**

**Agenda Item 1: Discussion with John Buechler, Director of Regulatory Affairs at the NYISO, on Implementation and Operations Issues at NYISO including Hierarchical Control, Organization and Staffing.**

## **a) Staffing**

(1) 165 at startup

(a) Virtually all NY power pool personnel came over to the NYISO. The Power Pool had no HR, CFO, market services, etc. type of staff.

(2) 199 currently

(3) 253 authorized

## **b) Functions**

(1) Executive, HR, Communications

(2) General Counsel and Regulatory Affairs

(a) They do not do permitting since the ISO does not construct facilities. FERC has virtually the entire jurisdiction, but NY State does assert jurisdiction for anything that FERC does not assert jurisdiction.

(b) NYISO does not have an environmental compliance department.

(c) The ISO has increased information retention needs over historic needs.

(d) NYISO uses a license plate rate scheme with boundaries at preexisting company boundaries. Congestion and other charges are added to constitute total charges for each user. The Transmission Owners get FERC approval for their transmission charges. The ISO recovers all costs using the Schedule 1 tariff charges, (This is the dispatch and scheduling charge tariff.) which FERC approves.

(e) FERC is heavily involved in the ISO tariffs. The NYISO files changes weekly with FERC at this point. FERC indicates they will take a closer and more active role in dealing with RTOs/ISOs.

(3) Market Services

(a) The NYISO uses both internal and external training to explain the ISO procedures to others. NYISO believes that this training cannot begin too early and must continue. This group also provides operator training and certification training. This includes ancillary services training, also. The NYISO charges for external training. These charges are designed to be 'break even'.

(b) All the utility people must be trained regarding the new processes and procedures.

(c) Customer relation issues were dramatically underestimated.

(4) Analysis and Planning

(a) Resource Reliability has no authority to acquire resources, but they do analysis to show that installed generating capacity exceeds the annual forecast peak by 18%.

(b) ISO versus TO. ISO has no authority to direct expansion, but must review, approve and study these expansions. They must identify problems. The TOs retain authority and set requirements regarding direct interconnections.

(5) Operations and Reliability

(a) The NYISO operates one control area. The NYISO has the authority but they do not 'push the buttons'. The ISO also does the 'unit commitment' process. All data and communication goes through existing Control Centers.

(b) The NYISO has a list of ISO controlled facilities. A second list of key facilities exists. This list of key facilities specifies that Transmission Owners

of lower voltage facilities must coordinate with the ISO before the TO can make operational changes.

- (c) The PX adds an unspecified amount of people.
- (d) They have a backup, but it is not a 'live or hot' backup. However, they transfer key information to the TOs' control centers and this provides backup and redundancy regarding operation.
- (e) They have various communication redundancies.

(6) Information Systems

- (a) This includes 2 – 24 x 7 support people.

(7) CFO and Compliance Officer

**c) Participation**

(1) All the former Power Pool transmission owners are part of the NYISO.

- (a) At formation, the NYISO went from eight control areas to one. NY State created significant motivation for this change.

(2) Generators

(3) Coops/REAs

(4) Retail load serving entities are also participants.

- (a) The operational workload falls on participants, as well as no added equipment. However; billing, scheduling and accounting has had to deal with added workload.
- (b) All load serving entities must provide load forecasts to the ISO, but the ISO creates a forecast, also.
- (c) Every retail program is unique, even though it is within NY. These programs need to be flexible so that the ISO can accommodate these differences.
- (d) Retail access added a couple of FTEs and required some additional software packages.

**d) Hiring practices**

- (1) They used key managers from the Power Pool and contract staff.
- (2) They brought in an 'independent' CEO before hiring the staff. The CEO had authority to remove/change the key managers. The contract staff was replaced once the CEO and managers were in place.
- (3) New hires have diverse backgrounds and do not necessarily come from electric industry sources.

**e) Added functions to meet Order 2000**

(1) They must enhance their planning and facility expansion capability.

- (a) This appears to be required.

(2) Governance

- (a) They have an independent board, but their governance empowers the stakeholder advisory board to veto certain actions. This might not be acceptable to FERC.

(3) Scope

- (a) A one state ISO may not be acceptable to FERC.

(4) External Loop Flow

- (a) They handle internal loop flow acceptably, but they have not addressed external loop flow.

**f) Other issues**

(1) Ancillary Service Provision

- (a) FERC mandated acceptance of bilateral self-supply. Therefore, transmission users can self-supply and arrange the transaction.
- (b) ISO must facilitate an ancillary services market.
- (c) The ISO must monitor congestion when administering this market.

(2) Congestion

- (a) The NYISO accepts all schedules and then clears congestion.

(3) Operations & Maintenance

- (a) Approximately \$60 million per year (\$54 million startup) includes about \$9 million for startup debt service.

(4) Market Monitoring and price verification

- (a) 2 – 3 FTEs are provided by outside consultants that do not show up on the sheet.

Note that overheads of John's presentation on Organization and Staffing are attached.

**Agenda Item 2: AGC Hierarchical Operation**

Both Bob's and Don's documents are attached. As with each task, the team is to finalize a set of issues, clarify questions going to other work groups, and recommend answers to issues. Consensus was reached that since at least one control area operator will give up its control area, the RTO must operate a control area. Some control area operators will remain in place and will perform RTO functions, if assigned, under the direction of the RTO. Consensus was also reached that specific generator operation, such as hydro optimization, should be managed at the local level, not at the RTO level.

**Agenda Item 2: Metering Operations and Retail Access**

Desert Star metering document is attached. See action item for Metering Operations and Retail Access Task Team.

**Agenda Item 3: Technology Requirements**

Don presented the attached updated document. See action item for Technology Requirements Task Team.

**Agenda Item 4: Support Functions (Renamed Organization and Staffing)**

Chris presented an updated Support Functions document. See action items for the Organization and Staffing Task Team.

**Agenda Item 5: Control Center Assessments**

Agreement was reached that while the questionnaires provided the required information concerning each potentially available control center, the assessment against needs could not be completed until the operational responsibilities had been finalized and the technology requirements had been defined. However, we may have enough information to create a short list. The Avista evaluation was presented, and the Avista site remains a viable candidate. The Portland PGE site was assessed. However the lease costs appear prohibitive. The remaining previously listed sites plus PGE Trojan will be assessed for the next meeting. Only sites that potentially could become available due to consolidation, down sizing, or relinquishment of the functions should be evaluated.

#### **Agenda Item 6: Issues from Seams Work Group**

- 1) Emergency re-dispatch: AGC Hierarchical Control task team has this issue. Emergency re-dispatch must be done by the RTO. Legal work group must provide this capability in the agreements.
- 2) Disturbance/restoration: Joint responsibility of the AGC Hierarchical Control and the Transmission System Security task teams.
- 3) Voltage control: Transmission System Security task team
- 4) Control Hierarchy: AGC Hierarchical Control task team
- 5) Contingency/Coordinating parallel flow through non-RTO shorts: Ralph to obtain more information from Kurt Conger
- 6) RAS coordination/limitations: Transmission System Security task team
- 7) Regional OTC study coordination: Joint Operations Planning team
- 8) Common treatment of generation resources: Ralph to obtain more information from Kurt Conger.

#### **Agenda Item 7: Operations Planning Joint Team**

Transmission Planning work group and the Implementation work group have agreed to form a joint task team to cover operations planning. LeRoy will coordinate the Implementation work group's participation.

#### **Agenda Item 8: Conference Calls with MISO and ERCOT**

Both MISO and ERCOT have agreed to conference calls to 1) educate us on their organization, staffing, and operations and 2) exchange ideas. We will finalize on Thursday at our meeting and send to MISO and ERCOT for their comments and an agreement on the times and dates.

Note that some topics are of primary interest to other work groups such as CM, AS Seams, MM, and Tx Planning. Hopefully, Implementation work group members who are also members of these other work groups will participate in the calls and represent their work groups.

#### **Next Meeting:**

The next meeting will be this Thursday and Friday, June 22 and 23, in the Kingstad Center. At this meeting the results of action items will be presented including:

- 1) Each team presenting a final issues list and recommendations for resolutions

- 2) Metering team presenting recommendations based on Desert Star and IndeGO documents
- 3) Assessment team presenting remaining centers
- 4) Finalization of participation with ERCOT and MISO

## ATTACHMENTS

### Implementation Work Group Meeting – June 16 Agenda

Discussion with John Buechler on Implementation and Operations Issues at NYISO including Hierarchical Control and Organization and Staffing	0830 – 0930
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#### Task Team Led Discussions of Issues

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|--|-------------|
| 1) AGC Hierarchical Operation            | 0930 – 1000 |
| 2) Metering Operations and Retail Access | 1000 – 1030 |
| 3) Technology Requirements               | 1030 – 1100 |
| 4) Support Functions                     | 1100 – 1130 |

#### Control Center Assessments

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|-----------|-------------|
| 1) Avista | 1130 – 1200 |
|-----------|-------------|

Lunch	1200 – 1300
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- |        |             |
|--------|-------------|
| 2) PGE | 1300 – 1330 |
| 3) BPA | 1330 – 1400 |

Issues from Seams Work Group	1400 – 1430
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Operations Planning Joint Team	1430 – 1445
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Conference Calls with MISO and ERCOT	1445 – 1515
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### *Talking Points for RTO West Support Functions*

#### *1. Human Resources and Training*

The Human Resources staff would include those who deal with general employee issues. The following tasks have been identified for this functional area:

- RTO West staff orientation and training
- RTO West compensation and benefit program administration and training
- Support employee selection process
- Track applicants
- Maintain employee records.

#### *2. Information Systems*

The Information Systems staff would include those responsible for all computer infrastructure activities. The Information Systems staff will support all computer and communications activities within RTO West including operations, accounting, billing, and administrative operations. The following tasks have been identified for this functional area:

- Accounting and Billing Applications
  - Purchase or Develop, maintain, and upgrade RTO West settlement and associated accounting and billing software
  - Ensure the security and integrity of the accounting and billing data
- System Planning and System Operations Applications
  - Purchase or Develop, maintain, and upgrade application software
  - Conduct factory and field acceptance testing
- Business Services and Other Applications
  - Support customer relations
  - Support RTO West staff training
- Database
  - Maintain power system models used for real-time operations, planning, and training simulator
  - Build and maintain EMS displays
  - Manage the archiving and retrieval of historical system and billing information for auditing and dispute resolution
- Intra Office Communications
  - Monitor the performance of communications interfaces to the ISN, public Internet, and RTO West intranet

- Identify requirements for any new communications services and interfaces
- System Monitoring Telemetry
  - Procure, Maintain, and Upgrade Telemetry necessary to interface with external control centers, WSCC/NERC interfaces, and system SCADA
- Hardware and Software Platform Support
  - Maintain servers for OASIS node
  - Maintain external communications interfaces
  - Maintain RTO West PCs, LANs, and peripherals
  - Maintain and upgrade software platforms
  - Provide shift technical support.

### **3. Customer Services**

The Customer Services staff handles issues related to customer contacts. The following tasks have been identified for this functional area:

- Administer and register transmission customer applications for RTO West services
- Prepare procedural manuals for transmission customers
- Conduct transmission customer training
- Coordinate customer visits and meetings
- Coordinate transmission customer dispute resolution.

### **4. Financial Services and Accounting**

The Financial Services and Accounting staff handles the bookkeeping, billing, settlements, and accounting functions for RTO West. The following tasks have been identified for this functional area:

- Process payroll and benefits for salary and hourly employees
- Define the processes and procedures for transmission service settlement
- Administer general ledger
- Prepare financial, regulatory, and management reports
- Administer asset accounting, depreciation, amortization, and tax reporting
- Support annual operating and capital budgeting process
- Administer accounts receivable, accounts payable, billing, and invoice payment processes and procedures.

### **5. Contract Administration**

The Contract Administration staff would include those responsible for FERC and State Regulatory Authority filings. The following tasks have been identified for this functional area:

- Administer RTO West contracts
- Analyze RTO West contracts
- Administer OASIS web site
- Monitor transmission tariff compliance
- Monitor FERC 888/889 compliance.
- Negotiate Interconnection and Service Agreements with RTO Customers
- Negotiate Contracts regarding system improvements, modifications, or additions with Transmission Providers.

## **6. Legal & Regulatory**

The Legal staff is responsible for providing legal counsel to RTO West.

- Represent RTO West in legal proceedings
- Administer dispute resolution process.
- Review and interpret FERC and State Regulatory Authority filings for RTO West
- Prepare FERC and State Regulatory Authority filings and proceedings

## **7. RTO West Implementation**

The RTO West Implementation staff would include those responsible for major implementation activities during startup. The following tasks have been identified for this functional area:

- Administer RTO West implementation
- Work closely with transmission owners/control areas to define requirements, interfaces, and data models
- Define processes and procedures
- Review and approve specifications for the communications infrastructure
- Enter into contracts for the communications infrastructure
- Enter into contracts for RTO West primary and backup facility construction/remodel activities
- Review and approve operator training program
- Participate in factory and field acceptance testing
- Conduct field trials in preparation for RTO West commissioning.

## **8. Planning&Operations System Analysis and Facility Engineering**

**The Planning & Engineering staff would study and access long term regional system expansion plans, determine RTC, TTC, seasonal OTC for transfer paths that are part of RTO Responsibilities (to be defined by Planning Work Group). Question-Would the RTO want “In-House” facility design expertise that would be able to access external facility designs for impacts on RTO operations and power transfers.**

- **Prepare and Maintain regional system model for planning & operations system analysis**
- **Coordinate individual system expansion plans for regional transmission providers**
- **Develop system expansion plans for congested RTO paths**
- **Perform Seasonal OTC studies to access the expected OTC maximum capabilities for each season**
- **Perform Near-term and real time system capability studies as requested.**

## **9. System Operations**

**[To be completed as part of a general group discussion]**

## **10. Scheduling and Commercial Interface**

**[To be completed as part of a general group discussion]**

## **Control Area Issues – RTOW IWG**

Watkins/Ryan/Harshbarger – DRAFT: June 15, 2000

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Note: The term “control area” is used in this paper. It can be largely equated with the “load balancing authority” currently being discussed in NERC.

### Assumptions:

- With regard to control areas, the RTO will be the single controlling authority over the RTO. (get language from Goddard)
- All use of the transmission of the RTO members will be arranged through the RTO including determination of OTC/TTC/ATC. Posting of capacity on the OASIS, accepting reservations, scheduling, and reconciliation/billing, etc.
- The RTO is responsible for all management of schedules and fulfillment of reliability and commercial obligations for its system. -
- The RTO will be a provider of last resort for region wide Ancillary Services
- The RTO must may implement market mechanisms to run real time markets to meet its AS and balancing energy needs.
- The RTO will operate a control area.
- The RTO must effectively account for zones with congestion between them when accomplishing generation control (including These zones usually do not correspond to static control area boundaries.

### Questions/Issues:

1. B1 (FERC) Does the RTO have ultimate “load balancing” responsibility and authority for it’s entire region?  
(ACE within boundaries of RTO kept to zero. Assurance of living within OTC. Load, services, interchange obligations implemented. (Not negating having self provision or pseudo control area.))  
Yes, as specified in FERC 2000.
2. B7 (with AS&CM) - Will the RTO start as a control area? One or several? Whose?  
Yes. It will have control authority over the entire RTO either directly or by hierarchical (master/satellite) control. Assume at least BPA’s will be in it with “direct” control plus all reasonably possible other members’.

If hierarchical, how will master/satellite control be accomplished? What control and indication is required? Feasible?

Is it most cost effective to maintain multiple controllers or just one?

Equipment and support is likely to be the same in either case. Other factors should dictate relative benefit.

3. B6 - How will the RTO master/satellite control areas interface with non-RTO control areas?  
Ex. Dynamic schedules and AS/CM services between control areas
4. B7 (AS & CM) - What is the criteria for what units will (continue to) be connected for direct control signals?
5. B1 (FERC?) - Will there be one OASIS for the RTO at start up?  
Yes plus wrapper such as estimated constraints, outage management, business processes, etc.
  - If so, who will accept reservations, the RTO alone or will each satellite control area have a role?  
RTO needs exclusive control over reservations. Implementation and clarity much better with passing simple interchange numbers and AS (or whatever).
6. B7 (with AS&CM) – Will there be one scheduling entity (& e-tag approver) for the RTO at start up?  
Yes, the RTO.  
Will satellite control areas have any specific information on or management of schedules involving their “control area”? What?
7. B0 or 6 or 7 - How will the RTO accommodate special optimization or control requirements of generation owners that are associated with the RTO generation control function (hydro optimization, non-electrical constraints, etc)?  
3 suggested principles:
  - 1) Acknowledge need for gen services to protect transmission system reliability.
  - 2) Generation asset owners want to be able to optimize their generation across the system, project, and at individual units.
  - 3) Generation asset owners want to be able to market gen products and services in own control area and in others.
 Ex. Merit orders, optimal dispatch, hydro regulation.  
Need to handle congestion.
8. B2 (to AS) - Will the RTO participate in a wider (than the RTO) reserve sharing program?
9. B3 (to NERC) - If you collapse control areas, present performance standards will have to be relaxed. Current practice assumes at least 10 CA’s for the randomness needed to arrive at present standards.
10. B3 (FERC?) - Can market participants/competitors in the commercial market be satellite CA’s?

11. B7 (w/AS&CM) - Is there a way, before a single direct control area, to allow for one (control/monitoring) connection for a generator that can supply AS to any of the RTO member control areas?

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Reliability

Identify the functions  
Who will perform them?  
Why?  
How?

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RRG seemed to suggest that market design would take place from AS, etc. Come up with processes. Assume set of units available for regulation. Different than traditional control. IWG have initial meeting.  
Puget's attorney: model of existing CA's under Midwest RTO was before FERC 2000. It appears FERC is more interested in control; that the RTO will be operating a CA.  
May require consolidation of Control areas. Understand this may not be feasible.

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- 0) We don't know and need guidance
- 1) Not an RTO issue (thanks, but no thanks)
- 2) Needs to be solved, but not implementation. Goes to another work group.
- 3) Not implementation but hand off to existing organization, not the RTO
- 4) Not implementation but hand off to new organization
- 5) The RTO must solve it once it is established
- 6) It is ours to solve. Come up with a solution, or a process to solve it.
- 7) It is implementation and at least one other work group.

**RTO IMPLEMENTATION DATA/TECHNICAL ISSUES (DRAFT JUNE 14, 2000)**

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 Mike Ryan - PGE, (503)464-8793 mike\_ryan@pge.com  
 Bob Harshbarger - PSE (425)882-4643 [bharsh@puget.com](mailto:bharsh@puget.com)  
 Mark Reynolds, Terry Doern

**What are the issues for technology and data for creating a NW RTO?**

1. B7 (w/?) - WHAT are the basic functional needs for the RTO?

<b>Category 1</b> most urgent or easiest to implement	<b>Category 2</b> less urgent or more difficult to implement	<b>Category 3</b> difficult or could stay with utility
➤ Scheduling	➤ DISPATCH	➤ RTO Training Simulator
➤ OASIS	➤ AGC	➤ Statistical analysis
➤ E-Tags	➤ SCADA	➤
➤ OUTAGE Coordination	➤ Mapboard	➤
➤ Communications – Voice	➤ Logging	➤
➤ Telephone Systems	➤ WSCCNet messages	➤ System Planning
➤ Communications – Data	➤ EHV data pool & ICCP	➤ Remedial Action Schemes
➤ Backup power	➤ Metering	➤
➤ HVAC	➤ Communications monitoring	➤
➤ Physical Security	➤ Operational Planning	➤
➤ Network - critical systems	➤ Powerflow study tools	➤
➤ IT e-mail, word processing, internet	➤ Advanced applications/ on-line powerflow study tools	➤
➤ (Security Coordinator?)	➤ Backup site	➤
➤ Support-legal, payroll, financial, etc.	➤ Critical Path Nomograms for arming RAS (BPA IPS)	➤ Other
➤ Business systems		

2. B7 (legal?) - Should facilities be shared between utilities and RTO?
  - Dispatch Floor? *Probably not but could share for BACKUP purposes.*
  - Operational Computer Systems? *Use utility systems if needed to meet schedule then transition to RTO systems if cost effective.*
  - Communications Systems? *Yes. Lease as needed.*
  - General Purpose Systems? *Share if cost effective. (e.g., telephone system)*
  - Office Space? *No power marketers! Some support staff from host utility may reduce cost.*
3. B6 - Are commercially available communications acceptable? For what? What requires entity owned communications systems?

4. B7 (w/ ?) - Will a special communications/data network be required for schedule coordinators, e-tagging, and scheduling coordination? Internet/Intranet sufficient?
5. B6 - Are RTO to RTU connections required for interchange metering?
6. B6 - Is ICCP on Frame relay of similar sufficient or general power system data (current, voltage, MW, MVAR, etc.?)
7. B7 (w/AS&CM) - Will direct control links from the RTO to generators be needed?
8. B6 - Are full system mapboards needed? Level of detail? Video displays.
9. B6 - How many dispatchers will be on shift? (dictates size of console area)
10. B6 - What are communications needs? What is available? What is best for NW RTO?
11. B7 (w/AS&CM) - Start with initial systems that match Dittmer facility? (ESCA)
12. B7 (w/pricing&legal) - Does the RTO need to own anything? Could they go to a standard office building.
13. B7 (w/market mon.)Tools to support Market Monitor function.
14. B7 (w/?) – Scope of scheduling, settling, billing system? Scopeability, reliability, flexibility?  
(BPA has system that likely meets criteria including provisions for b/u)
15. B7 (w/AS&CG) - Systems to support running AS or CG markets?  
(BPA's vender, TenFold has trading floor modules for running markets (not purchased))
16. B6 - For basic systems (SCADA, AGC, Telephone, MAPBOARD), which type is best for RTO?
  - New? purchase and develop?
  - Lease from utilities or commercial?
  - Existing from one of utilities? (e.g., use BPA Mapboard)
  - Copy from utility? New hardware, same software.
17. B7 (w/?) - How is real time data shared between RTO, Control Areas, Utilities, Generators, and Marketers?
18. B6? - Should the RTO directly monitor and control Substations and Generation?
  - Access through utility SCADA/EMS only? Interim or always?
  - Shared access to data with utility? Shared control with utility?
  - Access and control only by RTO? (e.g., CAL ISO Remote Access Gateway)
  - What has worked for CAL? Ask CAL ISO, PG&E, SCE, SDG&E
    - What is the most cost effective?
19. B6 - Support STAFF for critical and general purpose systems
  - Who should maintain? RTO staff? Utility staff? Contractor?
  - What level of support? 5X8? 7X24? Define for each system
  - What is the most cost effective?

20. B7 (w/RRG) - SECURITY COORDINATOR ISSUES

- Stay independent of utilities and RTO? Become part of RTO?
- PNSC runs online power flow? RTO runs online powerflow?
- Overrides marketing decisions if reliability is a problem?
- 

21. B7 (w/?) - BACKUP requirements for RTO and BPA:

**Functions in BOLD needed at BACKUP SITE**

<b>Category 1</b> Most urgent or easiest to implement	<b>Category 2</b> less urgent or more difficult to implement	<b>Category 3</b> difficult or could stay with utility
➤ <b>Scheduling</b>	➤ <b>DISPATCH</b>	➤ RTO Training Simulator
➤ OASIS	➤ <b>AGC</b>	➤ Statistical analysis
➤ <b>E-Tags</b>	➤ <b>SCADA</b>	➤
➤ OUTAGE Coordination	➤ <b>Mapboard</b>	➤
➤ <b>Communications – Voice</b>	➤ Logging	➤
➤ <b>Telephone Systems</b>	➤ <b>WSCNet messages</b>	➤ System Planning
➤ <b>Communications – Data</b>	➤ <b>EHV data pool &amp; ICCP</b>	➤ Remedial Action Schemes
➤ <b>Backup power</b>	➤ Metering	➤
➤ <b>HVAC</b>	➤ Communications monitoring	➤
➤ <b>Physical Security</b>	➤ Operational Planning	➤
➤ <b>Network - critical systems</b>	➤ Powerflow study tools	➤
➤ IT e-mail, word processing, internet	➤ Advanced applications/ on-line powerflow study tools	➤
➤ <b>(Security Coordinator other SC sites)</b>	➤ <b>Backup site</b>	➤
➤ Support-legal, payroll, financial, etc. ➤ Business systems	➤ <b>Critical Path Nomograms for arming RAS (BPA IPS)</b>	➤ Other

Backup site issues:

- a) Must backup site be in a geographically different area? 10 miles? 600 miles?
- b) Which functions must have full time staff at BACKUP SITE (7x24 hours)?
9. Who pays?
10. How are costs allocated to RTO for shared equipment
11. How are RTO costs allocated to RTO members, customers, Marketers or All.

Buckets:

- 0) We don't know and need guidance
- 1) Not an RTO issue (thanks, but no thanks)
- 2) Needs to be solved, but not implementation. Goes to another work group.
- 3) Not implementation but hand off to external organization, not the RTO
- 4) Not implementation but hand off to new organization
- 5) The RTO must solve it once it is established
- 6) It is ours to solve. Come up with a solution, or a process to solve it.
- 7) It is implementation and at least one other work group.

## RTO West Control Center Assessment

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David James, AVA, 509-495-4185, [djames@avistacorp.com](mailto:djames@avistacorp.com)

### Location

1. Company Avista Corp
2. Address E 1411 Mission Ave
3. City Spokane
4. State WA
5. Exact Control Center Location (what building, floor, etc)

---

AVA CAO located on 4<sup>th</sup> floor (4/5), west end of the main building

---

### Recruitment

1. Metro Populus (450,000 Spokane Metro includes Spokance City (189 k), CdA I D, Post Falls I D , unincorporated sections of Spokane Valley and North Spokane.)
  2. Population Dynamics (92white, 2.3hispanic, 1.5black, 1.6native american, 2.5asian, %other)
-

3. Utility Employ within Metro Area ([Combined AVA, IPL, KEC, ME, BPA, Vera 1800-2000](#))
  4. EHV Dispatch & Support Employees in Metro Area ([AVA Dispatch 13, Support 17, BPA-MCC ?](#))
-

## Transportation

1. Airport ([Spokane International](#), 20 minutes drive from Avista)
  2. Interstate Highways ([I -90](#), [SR2](#), [SR395](#), [SR195](#), Spokane has no N-S Freeway)
  3. Light Rail (N, proposed Spokane Valley 2002-2005)
  4. Mass Transit ([city bus](#))
  5. Traffic Congestion ([30 minutes roundtrip](#))
  6. Available Parking (# spaces, \$/day)
- 

## Quality of Life Issues

1. 1999 Forbes Ranking (best places to live)
  2. Average Daily Temperature ([yearly avg hi 57.5](#), [july avg hi 83.8 F](#))
  3. Annual Rainfall ([17 in](#))
  4. Annual Snowfall ([50 in](#))
  5. City Parks ([3 major](#), [40 total](#))
  6. Residential Historic District (#)
  7. Medical Center ([6 major facilities](#), [largest medical center in PNW less Seattle](#))
  8. Shopping Center ([4](#), [large malls](#))
  9. Air Quality (winter inversion problems, motor vehicle CO, CO2)
  10. Water Quality (aquifer recharge, hi quality)
- 

## Influence on Operating Cost

1. Property Tax ([\\$15/1000 assessed](#))
  2. Business & Occupation Tax ([assessed on gross revenue .138%-1.5%](#))
-

3. Sales Tax (8.1% food exempt)
  4. Other non-Federal Taxes (none)
  5. Median per Household Income (\$38,580 Cost of living index 104%  
of natl avg)
  6. Median Home Price (107,500)
-

Risk of Natural Disaster (rate H,M,L or rate of occurrence #/50 years)

1. Fire L (1/20)
  2. High Wind M (2/10)
  3. Tornado L (none)
  4. Ice storm L (1/100)
  5. Volcano L (St. Helens)
  6. Earthquake L (1/20)
  7. Flood L (1/10)
  8. Heat Wave M (1/5)
  9. Dust Storm M (1/10)
  10. Snow Storm H (1/2)
  11. Mudflow L (never)
  12. Sink holes L (never)
  13. Probability of Evacuation (%/year)
- 

#### Physical Description of Control Room

X2029 andy

1. Map Board (magnetic tile panels (same as BPA-MCC), arc length 76 x 15 ht)
  2. Interchange & Generation Display ([Paper chart recorder](#), [Ace](#), [Freq](#), [Generation](#), [Interchange](#))
  3. Dispatch Consoles (3, generation reliability, transmission dispatch, extra-storm)
  4. Control Room Dimension (65x 53, 11 ft ceiling)
  5. Self Contained Facilities ([lavatory](#), [kitchen](#), [locker](#))
- 

#### Support Staff

1. Office Space (81 x 29/207x 269)
-

2. Office Type (cubicle and office)
  3. Renovated (1998, cube walls & furniture)
  4. Office Computers (PC leased from IBM)
-

## Facility Electric

1. HVAC (standalone heat pumps x 2)
  2. UPS (Y, single, 30 minutes)
  3. AC building sources (2)
  4. Generator Backup (diesel generator, indefinite)
- 

## Fire Suppression

1. Halon (N, describe)
  2. Water (Y, overhead sprinkler)
  3. Fire Protection (Public, 3 minutes, Simplex Fire Alarm System (1999), monitored by Dispatch)
- 

## Security

1. Video Surveillance (Yes, guard station 24 hr, Video CR access)
  2. 24x7 Building Guard (Y, 2-3 on shift 24 hr)
  3. Access to CC (key card or phone/video recognition)
  4. Access to Building (key card for employees, security access main entrance for non-empl)
- 

## Control Center Communications

1. Satellite Phone (Y, no service)
  2. Radio (voting system. Coverage E WA (Spk-Colville-Othello), N Idaho (Lewiston/Grangeville-CAN border), W MT (Noxon))
  3. Fiber Optic (Major stations in Spokane, Avista owns F/O subsidiary installing trunk network in Spokane )
-

4. Phone Recorder ([digital DAT](#))
  5. Phone System ([building switch telephone and standalone connection to US West \(3 lines\), all lines switchable to Backup CC](#))
  6. Cellular Phones at Dispatch ([N, used for sustained emergency conditions \(e.g. Icestorm 96\)](#))
  7. PCS Phones ([N](#))
  8. Microwave Comm ([digital microwave 40%, analog 60%, direct connection to BPA microwave at Hatwai](#))
  9. WSCC Hotline Phone ([N](#))
  10. Weather Monitor ([Y](#))
  11. GPS Clock ([Y](#))
  12. Communications Support ([2](#))
- 

#### Computing/EMS

1. EMS ([ESCA, 6/98](#))
  2. EMS Platform ([VMS](#))
  3. EMS Development System ([Y](#))
  4. WSCCnet ([Y, 1 consoles](#))
  5. OASIS Node ([Y, trade-wave](#))
  6. Backup CC ([CdA Service Center, 45 min ground transp](#))
  7. Internet Comm ([buidling network and standalone modem](#))
  8. AGC ([ESCA](#))
  9. ICCP ([frame relay, MCI WorldCom](#))
  10. SCADA Support ([2](#))
  11. Data Logger ([analog & digital](#))
-

12. Real Time Data Archive (EMS Historical Data Recorder, 2 second data, digital, access by EMS console)
  13. Long Term Data Archive (hourly avg data to Oracle, access via Excel local or remote)
  14. Real Time Data Trending (Y, ESCA charts)
  15. EMS Load Forecast (N)
  16. Advanced Tools (none)
- 

#### **Other Issues**

1. Does this site comply with EPA, OSHA and other regulatory requirement? Yes
  2. Is the building independant of power market functions? No
  3. What is the yearly Dispatch cost of current Control Center operations (\$, # Dispatch)?
  4. What if the yearly cost of support staff (\$, # Staff)?
  5. Are there any special conditions under which this facility is available (No)
  6. Is there a transition period beyond 12/31/01? No
  7. Is the facility expandable? No
  8. Does the facility accommodate visitors? On appointment, small groups <10
- 

Survey Completed by: \_\_\_David James, 509-495-4185,  
djames@avistacorp.com\_\_\_\_\_

## RTO West Control Center Assessment

This survey will provide baseline information for the evaluation of NW utility control centers and their suitability for use as the primary or backup control center for RTO West. For your information, most questions are followed by an example answer shown in parenthesis. The RTO Implementation Work Group recognizes that some data may not be readily available but request that you make a reasonable attempt to answer all questions. Questions involving dollars should reflect U.S. currency and those involving physical measure should be expressed in English units.

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David James, AVA, 509-495-4185, [djames@avistacorp.com](mailto:djames@avistacorp.com)

Location

6. Company **Portland General Electric**

7. Address **121 SW Salmon St.**

8. City **Portland**

9. State **Oregon**

10. Exact Control Center Location (what building, floor, etc)

---

**World Trade Center, 3WTC 5<sup>th</sup> Floor**

---

### ***Recruitment***

5. Metro Populus (census population, describe Metro boundaries)

---

Metropolitan area (six counties) 1.7 million

6. Population Dynamics (%white, %hispanic, %black, %native american, %asian)

---

**82% - 5% - 7% - 1% - 5%**

---

7. Utility Employ within Metro Area (#)

---

**8. EHV Dispatch & Support Employees in Metro Area (#) 32**

---

## Transportation

7. Airport (Name, Distance to CC, ETT (estimated time of travel)) **PDX, 12 miles, 20 minutes depending on traffic**
  8. Interstate Highways (I identify, # Miles in Metro Area) **Interstate 5**
  9. Light Rail (Y/N, # Miles) **Yes**
  10. Mass Transit (type (e.g. bus, vanpool)) **Trimet Buses, Van Pool**
  11. Traffic Congestion (average commute time)
  12. Available Parking (# spaces, \$/day)
- 

## Quality of Life Issues

11. 1999 Forbes Ranking (best places to live)
  12. Average Daily Temperature (°F) **66 degrees summer, 38 degrees winter**
  13. Annual Rainfall (in) **approx.37 inches**
  14. Annual Snowfall (in) **couple inches**
  15. City Parks (#) **9,400 total acres in numerous parks**
  16. Residential Historic District (#) **several**
  17. Medical Center (#, Capacity) **11 major hospitals**
  18. Shopping Center (#, type) **5 shopping Malls**
  19. Air Quality **Good**
  20. Water Quality **Good**
- 

## Influence on Operating Cost

7. Property Tax (\$/1000 assessed) **low \$10,93 high \$16.44**
-

8. Business & Occupation Tax (%) **none, Franchise Fees, County Tax incl. In rate base**
  9. Sales Tax (%) **None**
  10. Other non-Federal Taxes (describe) **State Income Tax - 5% - 9% of taxable balance**
  11. Median per Capita Income (\$/year) **24,375, 1998 data**
  12. Median Home Price (\$) **187,500**
  13. **ACCRA cost of living comparison (national average 100) Portland = 112.5, Seattle = 118.7 Salt Lake = 103.0 Los Angeles = 123.1**
-

Risk of Natural Disaster (rate H,M,L or rate of occurrence #/50 years)

- 14. Fire **low**
  - 15. High Wind **low**
  - 16. Tornado **low**
  - 17. Ice storm **low**
  - 18. Volcano **low**
  - 19. Earthquake **medium**
  - 20. Flood **medium**
  - 21. Heat Wave **low**
  - 22. Dust Storm **low**
  - 23. Snow Storm **low**
  - 24. Mudflow **low**
  - 25. Sink holes **low**
  - 26. Probability of Evacuation (%/year) **1 - 2%**
- 

Physical Description of Control Room

- 6. Map Board (type, overall dimension) **Mauell, Transmission 13x38 ft**
- 

**Subtransmission 13x60**

---

- 7. Interchange & Generation Display (paper chart, LCD, projection screen) **Angus Paperless 4 w/16 channels each**
  - 8. Dispatch Consoles (#, describe) **Area Control Operator 2, Transmission Dispatcher 3, Supervisor 1**
  - 9. Control Room Dimension (sq. ft, height) **6788 sq.ft. height 15ft**
  - 10. Self Contained Facilities (lavatory, shower, kitchen, locker) **yes to all and sleeping facilities**
-

**Support Staff**

5. Office Space (exst sq. ft, expandable/available sq. ft), **17,990 sq.ft. total space on the 5<sup>th</sup> floor incl. SCC.**

---

**28,880 sq.ft. total space on 4<sup>th</sup> floor incl. Computer room**

---

6. Office Type (cubicle, office) **Cubicle**
7. Renovated (year, furniture)**various upgrade**
8. Office Computers (PC/Apple/mainframe) **PCs**
-

## Facility Electric

5. HVAC (type, redundant systems) **Main building central plant with redundant chillers and pumps. SCADA computer room has independent DX air cooled air conditioner**
  6. UPS (Y/N, #, duration) **yes, dual UPS 12 hour battery**
  7. AC building sources (#) **13Kv Network Feeders (3)**
  8. Generator Backup (fuel type, duration) **Diesel #2, 48 hours with SCC load only**
- 

## Fire Suppression

4. Halon (Y/N, describe) **no**
  5. Water (Y/N, describe) **yes, corp. computer room has preaction water system**
  6. Fire Protection (Public/Private, ETA) **Simplex Fire Alarm 24 hour in house monitoring**
- 

## Security

5. Video Surveillance (Y/N, in CC ?, other) **yes including entrance to SCC**
  6. 24x7 Building Guard (Y/N, # Employees) **yes, 15**
  7. Access to CC (key card, other) **Proximity Amag Card Access System**
  8. Access to Building (8x5 business hours, after hours) **Must PGE Employee or have escort**
- 

## Control Center Communications

13. Satellite Phone (Y/N, service) **yes with AMSC (Motient)**
-

14. Radio (frequency(s), voting system, sq. mi. coverage) **Four primary regional frequencies. System uses voted receivers and steered transmitters. Covers most of PGE service area (3,000 sq. miles)**
15. Fiber Optic (owned/leased, # ckt miles) **No. Minimal used for point-to-point connections**
16. Phone Recorder (tape, digital DAT, other) **Digital DAT WYGANT system**
17. Phone System (dedicated/building, manual/computerized, redundancy) **Centrex provided by US West to building. AVTEC consoles for SCC dispatcher**
18. Cellular Phones at Dispatch (Y/N, #) **yes both digital and analog phones**
19. PCS Phones (Y/N, #) **none**
20. Microwave Comm (analog/digital, # sites, connection to adj. CAs) **Digital, two connections paths from SCC to MW backbone. Analog to BPA. Fiber to tie from MW backbone to Pacificorp**
21. WSCC Hotline Phone (Y/N) **yes**
22. Weather Monitor (Y/N) **yes**
23. GPS Clock (Y/N) **yes**
24. Communications Support (# Staff) **4 Mgmt/Admin, 5 Engr/spec, 12 Comm techs**
- 

#### Computing/EMS

17. EMS (Vendor, Year, Releaser Ver., Open Architecture ?) **ABB**
18. EMS Platform (VMS, Windows, other) **VMS**
19. EMS Development System (Y/N) **No**
20. WSCCnet (Y/N, # consoles) **One**
21. OASIS Node (Y/N, type) **No, use BPA's OASIS node**

- 22.Backup CC (location, ETT) **Portland Service Center, 1 hour**
  - 23.Internet Comm (building network/dedicated, modem/T1) **in house, 2 T1**
  - 24.AGC (primary, backup) **Primary only**
  - 25.ICCP (F/O, frame relay, T1) **Frame Relay**
  - 26.SCADA Support (# Staff) **8 incl. 2 Field Techs**
  - 27.Data Logger (analog/digital) **none**
  - 28.Real Time Data Archive (analog/digital) **Analog**
  - 29.Long Term Data Archive (system (i.e. Oracle, PC), local/remote access) **none**
  - 30.Real Time Data Trending (Y/N) **Yes**
  - 31. EMS Load Forecast (Y/N, system) **no**
  - 32.Advanced Tools (dynamic stability analysis, state estimation (describe)) **none**
- 

#### **Other Issues**

- 9. Does this site comply with EPA, OSHA and other regulatory requirement? **yes**
- 10. Is the building independent of power market functions? **No, separated by floors**
- 11. What is the yearly Dispatch cost of current Control Center operations (\$, # Dispatch)? **Approximate \$3 million including support staff, Admin. EMS/SCADA**
- 12. What is the yearly cost of support staff (\$, # Staff)?
- 13. Are there any special conditions under which this facility is available (time, direct cost)?
- 14. Is there a transition period beyond 12/31/01?
- 15. Is the facility expandable? **Yes, could be costly to add to the 5 story building**

**16. Does the facility accommodate visitors? Yes, SSC has a viewing room  
w/accommodation for up to 30 people**

---

Survey Completed by:

Jon Fisker 503-464 -8346 email jon\_fisker@pgn.com

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### Location

11. Company: Sierra Pacific Power Company

12. Address: 6100 Neil Road

13. City: Reno

14. State: NV

15. Exact Control Center Location (what building, floor, etc): The Control Center is located on the 3<sup>rd</sup> Floor of Sierra Pacific Power Company's General Office Building.

---

### Recruitment

9. Metro Populus (census population, describe Metro boundaries): 241,120

10. Population Dynamics (%white, %hispanic, %black, %native american, %asian, %other): 86.1 %white, 11.6%hispanic, 2.5%black, 1.7%native american, 5.3%asian, 4.4%other

11. Utility Employ within Metro Area (#): 832

12. EHV Dispatch & Support Employees in Metro Area (#): ? The California ISO is approximately 100 miles West of Reno.

---

## Transportation

13. Airport (Name, Distance to CC, ETT (estimated time of travel)):  
Reno/Tahoe International Airport, 2 miles, 7-9 minutes
  14. Interstate Highways (Identify, # Miles in Metro Area): I 80, 13 miles  
US395, 20 miles
  15. Light Rail (Y/N, # Miles): N
  16. Mass Transit (type (e.g. bus, vanpool)): Bus
  17. Traffic Congestion (average commute time): less than 15 minutes
  18. Available Parking (# spaces, \$/day): 1100 spaces, free
- 

## Quality of Life Issues

21. 1999 Forbes Ranking (best places to live): 1999 Ranking - 134<sup>th</sup> 2000  
Ranking - 70<sup>th</sup>
  22. Average Daily Temperature (°F): 51°F
  23. Annual Rainfall (in): 10.32 in
  24. Annual Snowfall (in): 29.5 in
  25. City Parks (#): 84
  26. Residential Historic District (#): 3
  27. Medical Center (#, Capacity): 7, 1327 Beds
  28. Shopping Center (#, type): 33, Mall/Plaza/Center
  29. Air Quality: Good
  30. Water Quality: Excellent
- 

## Influence on Operating Cost

14. Property Tax (\$/1000 assessed): \$36.40/1000
-

15. Business & Occupation Tax (%): \$25/full-time employee, per quarter
  16. Sales Tax (%): 7.25%
  17. Other non-Federal Taxes (describe): *Taxes in Nevada are among the lowest in the nation: No Personal Income Tax, No Corporate Income Tax, No Unitary Tax, No Inventory Tax*
  18. Median per Capita Income (\$/year): \$30,214/year - 1997
  19. Median Home Price (\$): \$149,000
- 

Risk of Natural Disaster (rate H,M,L or rate of occurrence #/50 years)

- 27.Fire: L
  - 28.High Wind: M
  - 29.Tornado: none
  - 30.I ce-storm: L
  31. Volcano: none
  - 32.Earthquake: L
  - 33.Flood: L
  - 34.Heat Wave: L
  - 35.Dust Storm: L
  - 36.Snow Storm: M
  - 37.Mudflow: none
  - 38.Sink holes: none
  - 39.Probability of Evacuation (%/year): none
- 

Physical Description of Control Room

11. Map Board (type, overall dimension): Tile, semi-circle, 70 ft long

12. Interchange & Generation Display (paper chart, LCD, projection screen): Digital and paper chart recorders, LCD

13. Dispatch Consoles (#, describe): 4, new

14. Control Room Dimension (sq. ft, height): 3,000 sq. ft, 8.5 ft. tall

15. Self Contained Facilities (lavatory, shower, kitchen, locker): yes, yes, yes, yes

---

Recently Vacated IBM Mainframe Computer Room On Same Floor as Control Room

1. Approximately 4,000 sq. ft of unused existing computer room space

2. An additional 5,000 sq. ft of raised floor next to computer room

---

## Support Staff

9. Office Space (exst sq. ft, expandable/available sq. ft): 3,000 sq. ft available
  10. Office Type (cubicle, office): both
  11. Renovated (year, furniture): 10 years old
  12. Office Computers (PC/Apple/mainframe): PC, mainframe
- 

## Facility Electric

9. HVAC (type, redundant systems): Yes
  10. UPS (Y/N, #, duration): 300KVA dual Redundant System
  11. AC building sources (#): 3 Phase 24.9 kV
  12. Generator Backup (fuel type, duration): 12 cylinder caterpillar diesel model 3512, Generator is caterpillar 15R4, Output at 1800 rpm 480@30 60 Hz capacity 1050 kW Fuel Tank 6000 gallons, 60hrs/approx
- 

## Fire Suppression

7. Halon (Y/N, describe): Yes
  8. Water (Y/N, describe): Yes
  9. Fire Protection (Public/Private, ETA): Alarm system connected to fire stations
- 

## Security

9. Video Surveillance (Y/N, in CC ?, other): Yes Building and Control Center
  10. 24x7 Building Guard (Y/N, # Employees): Yes
  11. Access to CC (key card, other): Key card
-

12. Access to Building (8x5 business hours, after hours): All hours

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## Control Center Communications

25.Satellite Phone (Y/N, service): Yes

26.Radio (frequency(s), voting system, sq. mi. coverage): 48 – 800 MHz,  
Trucked, 60000 sq. miles

27.Fiber Optic (owned/leased, # ckt miles): approx. 200 miles

28.Phone Recorder (tape, digital DAT, other): digital DAT

29.Phone System (dedicated/building, manual/computerized, redundancy):  
MCI World Centrex

30.Cellular Phones at Dispatch (Y/N, #): Yes

31. PCS Phones (Y/N, #):

32.Microwave Comm (analg/digital, # sites, connection to adj. CAs): both,  
30, Yes

33.WSCC Hotline Phone (Y/N): Yes

34.Weather Monitor (Y/N): Yes

35.GPS Clock (Y/N): Yes

36.Communications Support (# Staff): 15 in Reno

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## Computing/EMS

33.EMS (Vendor, Year, Releaser Ver., Open Architecture?): ESCA 1.52 2000

34.EMS Platform (VMS, Windows, other): VMS

35.EMS Development System (Y/N): Yes

36.WSCCnet (Y/N, # consoles): Yes

37.OASIS Node (Y/N, type): Use SRP's node connected by 56KB frame relay circuit

38.Backup CC (location, ETT): In progress of testing Las Vegas as the Backup CC

39.Internet Comm (building network/dedicated, modem/T1): Corporate network has redundant internet connections

40.AGC (primary, backup): Primary

41.ICCP (F/O, frame relay, T1): Frame Relay

42.SCADA Support (# Staff): 15 Total EMS Programmer Types in Reno and Las Vegas

43.Data Logger (analog/digital): PC Loggers

44.Real Time Data Archive (analog/digital): Real time data going to our Intranet

45.Long Term Data Archive (system (i.e. Oracle, PC), local/remote access): Oracle, Both

46.Real Time Data Trending (Y/N): Yes

47.EMS Load Forecast (Y/N, system): No

48.Advanced Tools (dynamic stability analysis, state estimation (describe)): Reno is in the process of getting good state estimator numbers and then we will get ESCA's stability analysis going. Las Vegas has ESCA's state estimator and stability analysis working.

### Other Issues

17. Does this site comply with EPA, OSHA and other regulatory requirement?: Yes, Yes
  18. Is the building independant of power market functions?: No, not now. We are currently in the process of selling all or our generating plants.
  19. What is the yearly Dispatch cost of current Control Center operations (\$, # Dispatch) 11 Dispatchers
  20. What if the yearly cost of support staff (\$, # Staff)? Total of 15, 8 in Las Vegas 7 in Reno
  21. Are there any special conditions under which this facility is available (time, direct cost)? After the RTO has identified their specific computer room and office space needs, I can get you specific options and costs promptly.
  22. Is there a transition period beyond 12/31/01? NO
  23. Is the facility expandable? Yes
  24. Does the facility accommodate visitors? Yes
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