

# **PROTOCOLS MANUAL**

## **Arizona Independent Scheduling Administrator Association (AZ ISA)**

# TABLE OF CONTENTS

I.	INTRODUCTION	I-1
	1. History	I-1
	2. Phase-In of Retail Electric Competition in Arizona	I-2
	3. Protocols Manual and Amendments Thereto	I-3
	4. Scheduling Coordinators	I-4
	5. Certification of Scheduling Coordinators	I-5
	6. Initial Features and Ultimate Features	I-5
	7. Scheduling for Wholesale Transactions and Treatment of Existing Contracts	I-5
	8. Disputes	I-6
II.	DEFINITIONS	II-1
III.	TOTAL TRANSMISSION CAPABILITY DETERMINATION PRINCIPLES	III-1
IV.	TRANSMISSION RESERVATION AND OASIS MANAGEMENT PRINCIPLES	IV-1
	1. Purpose	IV-1
	2. Parties	IV-1
	3. General Conditions	IV-1
	4. Initial Features	IV-1
	5. Ultimate Features	IV-2
V.	ALLOCATED RETAIL NETWORK TRANSMISSION PROTOCOL	V-1
	1. Purpose	V-1
	2. Parties	V-2
	3. Initial Features	V-2
	4. Ultimate Features	V-3
VI.	SCHEDULING PROTOCOL	VI-1
	1. Purpose	VI-1
	2. Parties	VI-1
	3. Balanced Schedules	VI-1
	4. Must-Run Generation Requirements	VI-2
	5. Validation	VI-2
	6. Time Lines	VI-2
	7. Loss Factors	VI-5
	8. Existing Agreements for Transmission Service	VI-5
	9. Scheduling Ancillary Services Resources	VI-5
VII.	ANCILLARY SERVICES PROTOCOL	VII-1
	1. Purpose	VII-1
	2. Parties	VII-1
	3. FERC Ancillary Services	VII-1
	4. Transmission Requirements for Self-Provision	VII-2
	5. Interface Requirements for Self-Provision	VII-3

VIII.	MUST-RUN GENERATION PROTOCOL	VIII-1
	1. Purpose	VIII-1
	2. Parties	VIII-1
	3. Local Generation Management Options for Must-Run Generation Requirements	VIII-1
	4. Must-Run Generation Framework	VIII-2
	5. Must-Run Generation Protocol Sequence	VIII-3
IX.	ENERGY IMBALANCE PROTOCOL	IX-1
	1. Purpose	IX-1
	2. Parties	IX-1
	3. Principles	IX-1
	4. Energy Imbalance Service	IX-2
	5. Basis for Energy Imbalance Charges	IX-2
	6. Trading of Energy Imbalance Accounts	IX-3
	7. Ultimate Features Energy Imbalance Calculation	IX-4
	8. Energy Imbalance Settlement under the Initial Features or for Stand-Alone Competitive SCs under the Ultimate Features	IX-7
	9. Transmission and Distribution Loss Factors (TLFs and DLFs)	IX-9
	10. Unaccounted-For-Energy (UFE)	IX-10
	11. Comparability	IX-10
X.	CONGESTION MANAGEMENT PRINCIPLES	X-1
	1. Purpose	X-1
	2. Parties	X-1
	3. EHV Transmission Paths	X-1
	4. Congestion Management Process	X-2
XI.	EMERGENCY OPERATIONS PROTOCOL	XI-1
	1. Purpose	XI-1
	2. Parties	XI-1
	3. Interface Requirements	XI-1
	4. Emergency Operations	XI-1
	5. Emergency Conditions and Curtailments	XI-2
	6. Management of System Emergencies	XI-2
	7. Implementation of Emergency Dispatch Instructions	XI-3
XII.	AFTER-THE-FACT CHECKOUT PROTOCOL	XII-1
	1. Purpose	XII-1
	2. Parties	XII-1
	3. Checkout Process and Timelines	XII-1

## I. Introduction

### 1. History

On September 7, 1994, the Arizona Corporation Commission (“ACC”) conducted a workshop on retail electric competition. The purpose of the workshop was for the ACC, the ACC Staff (“Staff”), the utilities, and other concerned parties to learn more about the issues surrounding the potential for competition in the retail supply of electricity. The workshop was Arizona’s first step in identifying and addressing policy issues regarding retail electric competition and it resulted in the formation of an Electric Competition Working Group.

At an Electric Competition Working Group meeting held on January 25, 1995, three task forces were formed: (1) Energy Efficiency and Environment, (2) Regulatory, and (3) System and Markets. The System and Markets task force was charged with addressing transmission access and prices; transmission and generation system operation; system reliability; and other related issues. This task force was the first to investigate the various methods for operating a transmission system. These three task forces met during the next eighteen months and helped develop a set of draft rules on electric competition.

On August 28, 1996, Staff filed a set of draft rules on retail competition for review by all interested parties. Additional workshops were held to receive comments and three public comment meetings were held in early December 1996. After extensive public input at the workshops and the public comment meetings, the ACC issued Decision No. 59943 on December 26, 1996 adopting the Retail Electric Competition Rules (“Competition Plan”).

The ACC’s decision resulted in the formation of several different working groups with an objective to ensure the transition to a competitive retail electric market. Staff conducted numerous meetings of those working groups, addressing issues that included metering, meter reading, billing, safety, reliability, ancillary services, committed uses, must-run generation, development of operational protocols, and the feasibility of developing an independent system operator (“ISO”) or an independent scheduling administrator (“ISA”). These working groups conducted meetings in 1997 and the first seven months of 1998 to provide suggestions for amending the Competition Plan. Decision No. 61071, issued by the ACC on August 10, 1998, adopted rule amendments on an emergency basis addressing a number of pertinent technical, administrative, and regulatory issues needed in order to implement electric competition in Arizona.

Somewhat in parallel with this process, the Arizona legislature passed house bill 2663, the Electric Power Competition Act (“Act”), A.R.S. §30-801, et seq.

The Act was signed into law on May 29, 1998. The Act requires certain public power entities and the ACC to coordinate their efforts in the transition to retail competition to promote consistent statewide application of rules, procedures, and orders.

The stakeholders in the Competition Plan reached general consensus that to provide comparable non-discriminatory retail transmission access, and to facilitate a robust and efficient competitive electric market in Arizona, an ISO should be implemented. Consequently, the stakeholders in the Competition Plan and others in the Desert Southwest region undertook a process to evaluate the feasibility of forming Desert STAR, a regional ISO that would include Arizona. Efforts to form Desert STAR continue, spurred by the Notice of Proposed Rulemaking on Regional Transmission Organizations ("RTOs"), Docket No. RM99-2-000, issued by the Federal Energy Regulatory Commission ("FERC") on May 13, 1999.

Recognizing that Desert STAR cannot be operational in the timeframe necessary for implementation of the Arizona Competition Plan, the ACC's Reliability and Safety Working Group formulated a plan for an Arizona Independent Scheduling Administrator ("AZ ISA") that would operate in the interim until Desert STAR is established. This concept has been endorsed by the ACC, which set forth requirements for an ISA in its proposed rules governing implementation of the Competition Plan [Section R14-2-1609]. As a result, the AZ ISA was formed in September 1998 as a non-profit Arizona corporation to support the provision of comparable, non-discriminatory retail access to the Arizona transmission system to facilitate a robust and efficient competitive electric market in Arizona. Once Desert STAR is established as an RTO, the AZ ISA's responsibilities will be transferred to Desert STAR.

## **2. Phase-In of Retail Electric Competition in Arizona**

It is important to note that under the ACC's Competition Plan and the Electric Power Competition Act of 1998, retail electric competition in Arizona is being implemented in two phases. Stated very generally, 20% of the retail electric load in Arizona is eligible to elect to purchase commodity electricity and other competitive services starting in 1999, with eligibility extending to 100% of retail electric customers as of January 2001.

Additionally, the Act exempts certain electric service providers from the requirement to provide for retail electric competition in their service territories: small cities and towns; certain electrical, power, irrigation and water conservation districts; the Arizona Power Authority; and larger cities and

towns that affirmatively elect not to sell electric generation service outside their service territories.<sup>1</sup>

### 3. Protocols Manual and Amendments Thereto

During the development of the plan for the AZ ISA, the stakeholders determined the need for a set of operational and administrative protocols--the "Protocols Manual"--to govern operations of the AZ ISA. This Protocols Manual has been developed through a participatory process open to all stakeholders. The Protocols Manual defines the duties to be performed and the procedures to be followed by the AZ ISA, Arizona Control Area Operators that become members of the AZ ISA, and Scheduling Coordinators ("SCs").

The Protocols Manual addresses the following subjects as they affect transmission for retail electric competition: total transmission capability determination; retail transmission allocation; retail transmission reservations and use of OASIS or other websites; congestion management; emergency operations; must-run generation; ancillary services; energy imbalance for retail transmission; scheduling; and after-the-fact checkout/settlement for retail transmission.

The Protocols Manual addresses the responsibilities and interaction of the AZ ISA, the Arizona Control Area Operators that are members of the AZ ISA ("CAOs") and Scheduling Coordinators regarding provision of Retail Network Integration Transmission Service. Therefore, the Protocols Manual will be referenced by, or attached to and made part of, (1) the AZ ISA's Tariff, (2) the Open Access Transmission Tariffs ("OATTs") of the CAOs, (3) the agreements between the CAOs and Scheduling Coordinators, and (4) any other forms of agreement required to implement retail transmission access as developed by the AZ ISA Operating Committee. Such tariffs and other agreements affecting provision of retail transmission will be filed with FERC by the AZ ISA and its FERC-jurisdictional members and must be approved by FERC.

The Board of Directors of the AZ ISA recognizes the Protocols Manual as a dynamic document that will need to change as conditions warrant under Arizona's phase-in of retail electric competition. The Board has therefore formed a standing Operating Committee with responsibility for continued development and refinement of the Protocols Manual. Any member may request the Operating Committee to consider Protocols Manual revisions. Any revisions to the Protocols Manual recommended by the Operating Committee will require approval by the AZ ISA Board of Directors, amendment as necessary of the tariffs and agreements referenced above, and revised filings with FERC as appropriate.

---

<sup>1</sup> See the definition of "Public Power Entity," A.R.S. §30-801(16).

The Protocols Manual is not intended to create precedent for any governing agreement, tariff, protocols or associated agreements of Desert STAR or other RTO which may be formed that includes Arizona parties and transmission facilities. An AZ ISA member or a party to an AZ ISA-related agreement will not be held to have endorsed or agreed to any portion of the Protocols Manual for incorporation into the governing documents, tariff, protocols or associated agreements of Desert STAR or other RTO.

#### **4. Scheduling Coordinators**

The utilization of Scheduling Coordinators is a significant feature of Arizona's framework for retail electric competition, as developed through the ACC's stakeholder working group process, reflected in the ACC's Competition Plan, and incorporated in this Protocols Manual. Utilization Scheduling Coordinators is required for scheduling retail electric loads. There is no requirement for wholesale loads to be represented by Scheduling Coordinators. Wholesale transmission will continue to be provided pursuant to the CAOs' OATTs.

It is anticipated that the economic benefits of providing and charging for Scheduling Coordinator services will attract a pool of qualified Scheduling Coordinators sufficiently large enough to provide competitive SC services in the Arizona. The AZ ISA will conduct a survey to develop a list of interested providers.

Scheduling Coordinators are to comply with the Protocols Manual and applicable CAO agreements in performing the following primary functions: forecasting their customers' load requirements; submitting balanced schedules in which resources equal the customers' loads plus transmission and distribution losses; arranging for necessary transmission and ancillary services; purchasing or providing local generation as necessary for delivery into load zones with transmission import limitations; responding to system contingencies and curtailments on pre-schedule and real time basis as directed by the CAOs; and complying with the after-the-fact schedule checkout and settlement processes.

The Protocols Manual recognizes two types of Scheduling Coordinators ("SCs"): Competitive SCs and Standard Offer SCs. Competitive SCs provide Scheduling Coordinator services for those retail electric customers that elect to purchase competitive electric service. Standard Offer SCs provide Scheduling Coordinator services for their bundled retail service customers, i.e. those electric customers that cannot (because of phase-in) or do not elect to participate in retail competition.

## 5. Certification of Scheduling Coordinators

At a minimum all Scheduling Coordinators must meet the following criteria:

- Twenty-four hour manned operation for all days of the year.
- The ability to interface with the CAOs' websites, requiring real time (not dial-up) Internet access with a Web browser.
- Twenty-four hour telephone and facsimile capabilities.
- Electronic submission of load forecasts, schedules (including NERC tags), and actual customer load data.
- Availability for on-site inspection of operations prior to start-up of SC services and unannounced site visits.
- Notification in writing to the CAOs and AZ ISA regarding changes in scheduling personnel, office address, telephone and facsimile numbers, or e-mail addresses one week prior to the change.

The AZ ISA will act to certify Scheduling Coordinators, utilizing these general criteria. Additionally, the CAOs will require Scheduling Coordinators to meet their creditworthiness standards and, possibly, additional criteria specific to interfacing with their systems.

## 6. Initial Features and Ultimate Features

The Operating Committee has proposed implementation of AZ ISA functions in stages. Staging is necessary due to the 1999 start date for retail competition in Arizona, AZ ISA financial and staffing constraints, and the projection that a regional ISO will supercede the ISA in 2001 or 2002.

In recognition of this need for staged implementation, the Operating Committee has proposed both Initial Features and Ultimate Features for the AZ ISA Protocols. Initial Features are functions which the AZ ISA can implement at or shortly after start up, consisting primarily of oversight, compliance monitoring and dispute resolution roles, with the CAOs and SCs actually performing most functions. Ultimate Features represent functional goals for the AZ ISA, with the ISA taking a more hands-on role in the retail transmission scheduling process. In some cases, Ultimate Features will be implemented by the AZ ISA only if the inception of the Desert STAR ISO is delayed.

## 7. Scheduling for Wholesale Transactions and Treatment of Existing Agreements

The Protocols Manual addresses only the arrangements for providing Retail Network Integration Transmission Service for Arizona end-use customers that elect retail electric competition. The rights and obligations of transmission customers requesting and receiving wholesale Network Integration

Transmission Service or Point-to-Point Transmission Service and the CAO providing the service are defined by the CAO's Open Access Transmission Tariff ("OATT"). The AZ ISA Protocols do not change the way wholesale transmission service is requested or provided.

Similarly, the AZ ISA Protocols do not impact the provision of transmission service by Arizona CAOs to customers with Existing Agreements. Existing Agreements will continue to be implemented pursuant to their terms and conditions.

## **8. Disputes**

Disputes arising from the application or implementation of these Protocols shall be resolved pursuant to the Dispute Resolution procedures contained in Section 6 of the AZ ISA By-Laws.

## II. Definitions

**AZ ISA Operating Committee** — A standing committee of the AZ ISA formed to take on the responsibility for the continuing development and refinement of the Protocols Manual.

**Allocated Retail Network Transmission (ARNT)** — The pro-rata share of transmission paths within a given Control Area Operator's transmission network that are reserved as Committed Use for Retail Network Integration Transmission Service.

**Ancillary Services**— Interconnected operations services identified by the Federal Energy Regulatory Commission (FERC) under Order No. 888, issued April 24, 1996, as necessary to effect a transfer of electricity between purchasing and selling entities and which a Transmission Provider must include in an Open Access Transmission Tariff. The six Ancillary Services identified by FERC are: Scheduling System Control and Dispatch Service; Reactive Supply and Voltage Control Services from Generation Sources Service; Regulation and Frequency Response Service; Energy Imbalance Service; Operating Reserve: Spinning Reserve Service; and Operating Reserve: Supplemental Reserve Service.

**ACC** – The Arizona Corporation Commission.

**Available Transfer Capability (ATC)** — A measure of the transfer capability remaining in the physical transmission network for further commercial activity over and above Committed Uses.

**Arizona Independent Scheduling Administrator Association (AZ ISA)** – A non-profit Arizona corporation established to coordinate development of operational and administrative protocols necessary to implement retail direct transmission access in the State of Arizona, to act as a scheduling administrator on behalf of the providers and users of retail transmission service on the Interconnected Transmission System within the State of Arizona, and to oversee scheduling, reservation and OASIS management for Retail Network Integration Transmission Service by Control Area Operators and Transmission Providers which are members of the AZ ISA.

**Balanced Schedules** — Schedules are Balanced Schedules when the Scheduling Coordinator's Retail Network Resource Schedules, in whole megawatt increments, including Local Generation Requirement allocations, equal the Scheduling Coordinator's forecast of Retail Network Load, adjusted for losses, with respect to all entities for which the Scheduling Coordinator schedules.

**CAO Holiday** – Those holidays specified by the Control Area Operator. If a holiday falls on a Saturday, it is observed on the preceding Friday. Sunday holidays are observed on the following Monday.

**Committed Uses (CU)** --The amount of transmission capacity that is unavailable for sale to the marketplace due to reservations for network transmission service uses; prudent reserves; existing contractual commitments for power purchases, exchanges, and sales; existing contractual commitments for transmission service; other pending potential uses of transfer capability pursuant to pending transmission requests; and a transmission reliability margin. Committed Uses are further defined in the report entitled "Determination of Available Transfer Capability within the Western Interconnection", adopted by the Colorado Coordinated Planning Group, Northwest Regional Transmission Association, Southwest Regional Transmission Association, Western Regional Transmission Association and Western Systems Coordinating Council in March 1997, as follows:

**Committed Use 1 (CU1)** – Native load uses (retail load)

**Committed Use 2 (CU2)** – Prudent reserves

**Committed Use 3 (CU3)** – Existing commitments for purchases/  
exchanges/deliveries/sales

**Committed Use 4 (CU4)** – Existing commitments for transmission service

**Committed Use 5 (CU5)** – Other pending potential uses of transfer capability

**Competitive Scheduling Coordinator (Competitive SC)** – A Scheduling Coordinator that schedules power transactions for end-use electric customers purchasing commodity electricity from ESPs.

**Control Area (CA)** — An electric system or systems, bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other Control Areas and contributing to frequency regulation of the Interconnected Transmission System.

**Control Area Operator (CAO)** — A Transmission Provider that operates a Control Area or a sub-Control Area within the State of Arizona and which is a member of the AZ ISA. Control Area Operators which are members of the AZ ISA at the time of the AZ ISA's formation are Arizona Electric Power Cooperative, Arizona Public Service Company, Salt River Project Agricultural Improvement and Power District, and Tucson Electric Power Company.

**Curtailment** — A reduction in the scheduled capacity or energy delivery.

**Direct Access Service Request (DASR)** — A form that contains all necessary billing and metering information to allow end-use customers to switch Electric Service Providers. This form must be submitted to the Utility Distribution Company by the customer's Electric Service Provider or the customer.

**Discretionary Local Generation** — Local Generation that Scheduling Coordinators schedule at their own volition for Retail Network Load within a Load Zone.

**DLF** -- Distribution Loss Factor.

**Dynamic Schedule** — A telemetered reading or value that is updated in real time and used as a Schedule in the automatic generation control/area control error equation, the integrated value of which is treated as a Schedule.

**Electric Service Provider (ESP)** — A company supplying, marketing, or brokering at retail any of the Competitive Services described in the ACC's Retail Electric Competition Rules. ESPs referenced in the AZ ISA Protocols are those that supply the competitive services of commodity electricity.

**EHV** – Extra high voltage, generally 230 kilovolts (kV) and above.

**Emergency** — Any abnormal system condition that requires automatic or immediate manual action to prevent or limit loss of transmission facilities or generation supply that could adversely affect the reliability of the electric system.

**Energy Imbalance** – The energy difference (in MWh) between a Scheduling Coordinator's Schedule and its share of actual Retail Network Load, including all applicable losses for the Schedule hour.

**Energy Imbalance Service** – The supply of any mismatch between a Scheduling Coordinator's Schedule and the Retail Network Load being served by the Scheduling Coordinator in the Control Area. This enables a settlement process that assigns payments or penalties, or both, to compensate for mismatches. While Energy Imbalance is principally a measurement for commercial settlement purposes, it is important for system reliability. The Control Area Operator maintains the system in balance on a real-time basis and can do so only to the extent that all users of the transmission system provide accurate Schedules and adhere to those Schedules. Consequently, Scheduling Coordinators are encouraged through financial incentives to maintain interchange transactions accurately and to minimize Energy Imbalances. Energy Imbalance is a measurement necessary to ensure that users do not lean on the Interconnected Transmission System.

**Existing Agreement** — Any agreement for use of the Interconnected Transmission System in the State of Arizona in place as of July 1, 1999.

**Fixed Cost** — Those costs of generation, transmission or distribution of electricity which do not vary with the kilowatthours (kWhs) produced, sold, or transmitted. These are annual costs associated with expenses that are (or would be) incurred by an electric utility irrespective of the output of its generation resources or the throughput of transmission and/or distribution facilities used for the delivery of power and energy. Typically this would include expenses such as: depreciation, taxes (income, payroll, property), insurance, cost of money, return on investment, rents that are unavoidable, administrative and general (A&G) and operations and

maintenance (O&M) expenses that are not otherwise avoidable, allocated general plant, allocated intangible plant, and cash working capital.

**Import Limit** — The maximum amount of electric power that can be transferred into a Load Zone while maintaining system reliability. Some factors to be considered when assessing system reliability are voltage stability, thermal limits and resource deficiencies.

**Import Limited Load Zone** – A Load Zone with a defined Import Limit.

**Initial Features** — The features that will exist prior to the AZ ISA implementing the necessary procedures and technology to perform the functions assigned to it as Ultimate Features within the AZ ISA Protocols.

**Interconnected Transmission System** -- The portion of the transmission system utilized for bulk power transactions, generally at voltages of 115 kV and higher.

**kW** – Kilowatt, or 1,000 watts.

**kWh** – Kilowatthour, or 1,000 watts per hour.

**Load** — The amount of electric power delivered or required at any specified point or points on a system.

**Load Profiling** —A process of estimating end-use customers' hourly energy consumption based on measurements of similar customers.

**Load Zone** — A Load-serving portion of the electric system delineated for operating purposes.

**Local Generation** — Generation located within a Load Zone.

**Local Generation Requirements** —The amount of Local Generation required to avoid exceeding a Load Zone's Import Limit.

**Loop Flow** —The inherent characteristic of the Interconnected Transmission System whereby there is a difference between the scheduled and actual power flow, assuming zero inadvertent interchange, on a given transmission path. Synonyms: Parallel Path Flow and Unscheduled Power Flow.

**Loss Factors** —A factor projected by the Control Area Operator that will be applied to provide for the recovery of electrical losses ( $I^2R$ ) on the Control Area Operator's transmission and/or distribution system.

**Market Price** – For purposes of Energy Imbalance Service settlement, Market Price is the California Independent System Operator (ISO) hourly ex-post market price for

real-time imbalance energy for the Southern California Zone SP 15 (south of Path 15), as published on the California ISO OASIS website under ex-post market information history, as posted 10 days prior to the date settlement statements are issued.

**Must-Offer Generation** — The Must-Run Generation less any previously committed Local Generation.

**Must-Run Generation** — Local Generation required to operate for electric system security.

**MW** – Megawatt, or 1,000 kilowatts (kW).

**MWh** – Megawatthour, or 1,000 kilowatts per hour.

**NERC** -- The North American Electric Reliability Council.

**Non-Compliant** — A condition where any party to the AZ ISA Protocols fails to fulfill its obligation under the Protocols. Such condition may constitute a material breach of the Scheduling Coordinator Agreement between and Control Area Operator and the Scheduling Coordinator and may result in the termination of the Scheduling Coordinator's rights under such agreement.

**OASIS (Open Access Same Time Information System)** — An electronic bulletin board where transmission-related information is posted for all interested parties to access via the Internet to enable parties to engage in transmission transactions.

**Open Access Transmission Tariff (OATT)** — Individual Transmission Provider's tariff for open access transmission filed with FERC.

**Operating Reserve: Spinning Reserve Service** — Provision of unloaded generation, under the control of the Control Area Operator, which is synchronized and ready to serve additional demand immediately and is fully available within ten (10) minutes.

**Operating Reserve: Supplemental Reserve Service** — Provision of additional capacity from electricity generators that can be used to respond to a system contingency within a short period, usually ten minutes.

**Point-to-Point Transmission Service** — The reservation and transmission of capacity and energy on either firm or non-firm basis from the point(s) of receipt to the point(s) of delivery.

**Protocols** -- Operational and administrative protocols performed by the AZ ISA, Control Area Operators and Scheduling Coordinators to implement retail direct transmission access in the State of Arizona.

**Regulation and Frequency Response Service** — Provision of service that follows moment-to-moment variations in the demand or supply in a Control Area and maintains scheduled interconnection frequency.

**Retail Network Load** — The Load that a Scheduling Coordinator designates for Retail Network Integration Transmission Service under the Transmission Provider's OATT.

**Retail Network Integration Transmission Service (RNITS)** —Transmission service provided to a Scheduling Coordinator for use to serve its share of Retail Network Load within a Control Area pursuant to the Transmission Provider's OATT.

**Retail Network Resource** — Any designated generating resource owned, purchased or leased to serve Retail Network Load. Retail Network Resources do not include any resource or any portion thereof, which is committed for sale to third parties or otherwise cannot be called upon to meet Retail Network Load on a non-interruptible basis.

**Reactive Supply and Voltage Control From Generating Sources Service** — Provision of reactive supply through changes to generator reactive output to maintain transmission line voltage and facilitate electricity transfers.

**Schedule** — An agreed-upon transaction size (megawatts), start and end time, beginning and ending ramp times and rate, and type required for delivery and receipt of power and energy between the contracting parties and the Control Area(s) involved in the transaction.

**Scheduling Coordinator (SC)** – An entity that provides schedules for power transactions over transmission or distribution systems to the party responsible for the operation and control of the transmission grid, such as a Control Area Operator, Independent Scheduling Administrator, or Independent System Operator.

**Scheduling, System Control, and Dispatch Service** — Provision for service for a) scheduling, b) confirming and implementing interchange schedules with other Control Areas, including intermediary Control Areas providing transmission service, and c) ensuring operational security during interchange transactions.

**Standard Offer Scheduling Coordinator (Standard Offer SC)** – A Scheduling Coordinator that schedules power transactions for bundled retail loads.

**Southwest Reserve Sharing Group (SRSG)** – Parties to the SRSG Agreement, which include the CAOs defined under the AZ ISA Protocols, pool certain

generating resources to meet the reserve requirements set forth by NERC and the WSCC.

**System Incremental Cost (SIC)**— System Incremental Cost means any increase in cost incurred by the Control Area Operator as a result of providing Energy Imbalance Service under these Protocols requiring the utilization of the Control Area Operator's dispatchable generation or purchases from third-parties. SIC shall be computed as the weighted average price of the highest-cost dispatchable generation and/or third-party purchases made by the real-time operators incurred by the Control Area Operator up to an amount of energy equal to the system net energy imbalance<sup>2</sup>. SIC for both the generation and purchased power components shall be determined by the real-time operator at the time the real-time operator makes a decision on the source of the energy supply.

**TLF** -- Transmission Loss Factor.

**Total Transfer Capability (TTC)**— The total transfer capability of a transmission path at any point in time is its reliability limit, an amount that can not exceed the path rating.

**Transmission Provider (TP)** — An entity that owns, controls or operates facilities used for the transmission of electricity in interstate commerce and provides transmission service under an OATT. For purposes of these Protocols, an Arizona Transmission Provider that is a member of the AZ ISA and operates a Control Area or sub-Control Area will be referred to as a Control Area Operator, as such term is defined within these Protocols.

<sup>2</sup> For example, assume the system net energy imbalance for the hour was 100 MWh and the following energy supply information:

Source	Cost	Source's Total MWh Supplied
Combined Cycle 1	\$20/MWh	40
Real Time Purchase	\$30/MWh	40
Combustion Turbine 1	\$40/MWh	40

The calculation of average price of the highest cost would be:

Source	Cost	Source's Total MWh Supplied	MWh Supplied for Imbalance	Total Cost for Imbalance
CC 1	\$20/MWh	40	20	\$ 400
RT Purchase	\$30/MWh	40	40	1,200
CT 1	\$40/MWh	40	40	1,600
			100	\$3,200

Weighted Average Cost = SIC = \$3,200/100 MWh = \$32.00/MWh.

**Ultimate Features** — The features that will exist once the AZ ISA has implemented the necessary procedures and technology to perform the functions assigned it within the AZ ISA Protocols.

**Unaccounted For Energy (UFE)** – The difference between the energy that enters the Control Area (generation and interchange) and the Control Area Load plus the appropriate losses.

**Variable Cost** — Those costs of generation, transmission or distribution of electricity that do vary with the kWhs produced, sold, or transmitted. Variable Costs associated with a generating unit include, but are not limited to, fuel and variable operating and maintenance (O&M) costs of the unit.

**Utility Distribution Company (UDC)** — The electric utility entity that constructs and maintains the distribution system for the delivery of power to the end user.

**WSCC** – The Western Systems Coordinating Council.

**WSCC Unscheduled Flow Mitigation Procedure**— A WSCC Procedure used by the Control Area Operator to alleviate loop flow on the transmission system.

**WSCC Qualified Path**— A transmission path that qualifies for curtailments due to unscheduled flow in accordance with the WSCC Unscheduled Flow Mitigation Procedure.

### **III. Total Transmission Capability (TTC) Determination Principles**

#### **1. Each CAO shall**

- 1.1 Determine TTC and Committed Uses for paths located within its transmission system. This will be done in consultation with the Operating Committee of the AZ ISA.
- 1.2 Notify the AZ ISA of changes to TTC for paths located within its transmission system.

#### **2. The AZ ISA Executive Director shall**

- 2.1. Participate in the determination of TTC and Committed Uses within the WSCC.
- 2.2. Cause the AZ SA to become an affiliate member of the WSCC and attend pertinent WSCC meetings and work groups.
- 2.3. Cause the AZ ISA to become a member of SWRTA and participate in SWRTA-sponsored regional coordinated transmission planning efforts.
- 2.4. Attend WSCC Operating Committee Study Group (OCSG) meetings for discussion of seasonal ratings on qualified paths with the AZ-NM sub-region of the WSCC.
- 2.5. Lead the AZ ISA Operating Committee (OC) for consistent application of Committed Use determinations within Arizona.
- 2.6. Participate in all Arizona joint-utility operating and planning study efforts for TTC.
- 2.7. Participate in the coordination of transmission maintenance schedules among CAOs and TPs.

## **IV. Transmission Reservations and OASIS Management Principles**

### **1. Purpose**

The purpose of these principles is to delineate the role of the AZ ISA with respect to Retail Network Integration Transmission Service (RNITS) reservation practices and OASIS management. Under the Initial Features, OASIS management for RNITS will continue to be performed by the CAOs, with AZ ISA oversight. Under the Ultimate Features, the AZ ISA will administer a single statewide OASIS for reservations for both RNITS and wholesale transmission service until such time as the Desert Star ISO takes over such function.

### **2. Parties**

The Transmission Reservation and OASIS Management Principles apply to the following entities:

2.1 Scheduling Coordinators (SCs)

2.2 Control Area Operators (CAOs)

2.3 AZ ISA

### **3. General Conditions**

3.1 There will be no change in the processing of requests for Point-to-Point Transmission Service by the CAOs. CAOs will continue to ensure that their OASIS systems comply with FERC requirements.

3.2 CAOs will continue to provide wholesale transmission service pursuant to their OATTs. It is not the intent of the AZ ISA Protocols to modify the provision of wholesale transmission services as specified in the CAOs' OATTs or to alter Existing Agreements.

### **4. Initial Feature**

4.1 AZ ISA will develop a "same-time" view into each CAO's OASIS so that it can be actively notified of all new transmission reservation requests and transmission reservation status changes for both wholesale transmission service and RNITS.

4.2 AZ ISA will be copied simultaneously by the CAOs on all RNITS Schedules.

4.3 AZ ISA will monitor release of ATC on each CAO's OASIS.

4.4 AZ ISA will begin to develop systems to allow it to calculate and update ATC.

**5. Ultimate Features**

The AZ ISA will develop one statewide OASIS in which:

- 5.1 All ATC for the CAOs' transmission systems is posted
- 5.2 All wholesale and retail transmission reservation requests are received and forwarded to the respective CAOs.
- 5.3 Ancillary Services and secondary transmission are posted.

## V. Allocated Retail Network Transmission Protocol

### 1. Purpose

The Allocated Retail Network Transmission (ARNT) Protocol will govern the allocation of Retail Network Integration Transmission Service (RNITS) among Competitive and Standard Offer SCs in Arizona's competitive retail electricity market.

The purpose of this Protocol is to ensure that each SC is provided comparable, non-discriminatory access to the CAO's transmission system to serve its share of total Retail Network Load. This objective will be met by allocating to each SC a pro-rata share of each transmission path within a given CAO's transmission system network that is reserved as a Committed Use for RNITS. For the purposes of this allocation, a CAO's transmission system will include transmission provided under contract from a third party that historically has been used to serve Retail Network Load, the cost of which is included in the CAO's annual transmission revenue requirements under its OATT.<sup>3</sup> An SC's pro-rata share of a transmission path (the SC's ARNT) will be determined by dividing the Retail Network Load served by the SC in a given service area by the total Retail Network Load in the service area and multiplying that factor times the RNITS Committed Use on the transmission path. After SCs receive their ARNT, they can then make the necessary arrangements with one another (or through the reservation of ATC) to align the transmission paths they wish to use with the Retail Network Resources they plan to schedule.

RNITS can be used only to serve Retail Network Load within the CAO's service area. In addition, RNITS may not be converted to other types of transmission service, such as Point-to-Point Transmission Service. However, SCs may acquire Point-to-Point Transmission Service, if it is available, in addition to their ARNT to serve their shares of Retail Network Load, pursuant to the CAO's OATT.

The implementation of this Protocol will be phased in. Ultimate Features of the Protocol will provide for the trading of ARNT among SCs once the AZ ISA has implemented the necessary procedures and communication tools to account for: (1) the trading of ARNT, and (2) the exchange of ARNT for ATC, within a given CAO's transmission system. Until such time, Initial Features of the Protocol will be used for allocating RNITS.

---

<sup>3</sup> Pro-rata access to other transmission that is contracted for from a third party and has historically been used to serve retail load is still under debate. At this time, the Protocols Manual does not dispose of this issue one way or another.

## 2. Parties

The Allocated Retail Network Transmission Protocol applies to the following entities:

- 2.1 Control Area Operators (CAOs)
- 2.2 Scheduling Coordinators (SCs)
- 2.3 AZ ISA

## 3. Initial Features

- 3.1 Initial Features will govern the allocation of RNITS until the AZ ISA has implemented the necessary procedures and communication tools to account for: (1) the trading of ARNT, and (2) the exchange of ARNT for ATC, within a given CAO's transmission system.
- 3.2 The transmission requirements needed to serve the CAO's total Retail Network Load will be determined by the CAO on a monthly basis, based on the CAO's current retail customer Committed Use allocations.
- 3.3 On the 15<sup>th</sup> day of each month, each CAO will post for the following month its
  - 3.3.1 hourly Loss Factors,
  - 3.3.2 estimated hourly total Retail Network Load,
  - 3.3.3 estimated hourly total Local Generation Requirements, and
  - 3.3.4 the total retail Committed Use reservation for each hour on each transmission path.SCs may use this information to estimate their ARNT.
- 3.4 Six Days Ahead
  - 3.4.1 The CAO will total the energy scheduled by each SC for the SC's share of total Retail Network Load during the Control Area's previous day peak hour.
  - 3.4.2 The CAO will divide each SC's previous day Retail Network Load Schedule for the Control Area's peak hour by the total Retail Network Load Schedules during that peak hour. The resulting percentage is then used to determine the SC's ARNT for the corresponding day of the subsequent week.
  - 3.4.3 The CAO will multiply the retail Committed Use reservation on each transmission path (from Section 3.3.4 above) by each SC's percentage (from Section 3.4.2 above). The resulting hourly MW quantities for each SC will be provided as ARNT to that SC by the CAO.

### 3.5 Day Ahead

- 3.5.1 Any ATC posted on the CAO's OASIS may be acquired by an SC to serve its share of Retail Network Load.
- 3.5.2 Any ARNT allocated to an SC which is not scheduled by the SC as of the day ahead Schedule deadline (see the AZ ISA Scheduling Protocol, Sections 6.3 and 6.4) will be posted as ATC on the CAO's OASIS.
- 3.5.3 The CAO will verify that the sum of an SC's Retail Network Load Schedules on a transmission path does not exceed that SC's ARNT on that path.

### 3.6 Changes to System Configuration

Whenever system configurations change such that the Import Limits or Local Generation Requirements change, each SC's ARNT and share of Local Generation Requirements will also change accordingly. Allocation factors (Section 3.4.2 above) will remain the same.

**Note:** Certain conditions on some CAOs' systems may result in ARNT that is insufficient to serve an SC's share of total Retail Network Load, even when there is no Local Generation Requirement. At such times, the SC will be allowed to acquire, at no additional charge, that amount of ATC, which, when taken in combination with the SC's ARNT, is sufficient to serve the SC's share of total Retail Network Load. ATC so acquired will be designated as RNITS.

## 4. Ultimate Features

Ultimate Features will be implemented once the AZ ISA has necessary systems and procedures in place to account for (1) the trading of ARNT, and (2) the exchange of ARNT for ATC, within a given CAO's transmission system. Before the Ultimate Features can be implemented, the AZ ISA must ensure that mechanisms are placed into operation for tracking both the trading of ARNT and the exchange of ARNT for ATC. The AZ ISA will promptly notify affected CAOs of any exchanges of ARNT for ATC.

- 4.1 SCs may, in effect, trade allocations of specific transmission paths through the coordinated re-designation of Retail Network Resources and/or the reassignment of ARNT within the requirement that each SC submit Balanced Schedules.
- 4.2 By September 1 of each year, each CAO, with oversight by the AZ ISA, will determine the total retail Committed Use reservations on each transmission path on a monthly basis for the next calendar

year and on an annual basis for the next ten years. The determination of retail Committed Use reservations will be based on the CAO's forecast for total Retail Network Load and the projections for Retail Network Loads and Retail Network Resources made by Electric Service Providers and SCs. The retail Committed Use reservations on the CAO's transmission paths will be used to update long term ATC on the OASIS. ARNT for individual SCs is not determined at this time.

- 4.3 On the 15<sup>th</sup> day of each month
- 4.3.1 Each CAO will post for the following month its
- 4.1.3.1 hourly Loss Factors,
  - 4.1.3.2 estimated hourly total Retail Network Load,
  - 4.1.3.3 estimated hourly total Local Generation Requirements, and
  - 4.1.3.4 the total retail Committed Use reservation for each hour on each transmission path.
- 4.3.2 The AZ ISA will forecast each SC's daily peak Retail Network Load for each day of the following month, using load forecasts developed from DASRs and the corresponding retail customer's load information data.
- 4.3.3 Local Generation that is committed to run and schedule outside the Load Zone by the 15th day of the month ahead will increase MW for MW the ARNT on any EHV path that the Local Generation is scheduled on, up to the TTC on the path (in either direction). All ATC into an Import Limited Load Zone and new ARNT from reverse reservation credit will be available to include in initial ARNT allocation on the 15th day of the month ahead. ARNT can be allocated up to the lesser of:
- Total ARNT plus ATC, or
  - Import Limit, considering exports
- 4.3.4 The AZ ISA will calculate each SC's share of total Local Generation Requirements for each hour of the following month and each SC's ARNT for each transmission path for each hour of the following month, using the allocation factor method outlined in Section 3.4 of this Protocol. The AZ ISA will communicate the results of this allocation to all SCs on the 15th of each month.
- 4.3.5 In the event that one or more transmission path's reservations exceeds its TTC, the AZ ISA will instruct the SCs to adjust their designated Retail Network Resources to

reduce the transmission path total reservation to the transmission path TTC. The AZ ISA will develop a methodology for implementing this backstop. The AZ ISA will submit the Retail Network Load and Retail Network Resource forecasts to the CAOs and each CAO will immediately update ATC on the CAO's OASIS accordingly.

- 4.4 Until two days ahead of the Schedule day, SCs may continue to (a) trade their ARNT among themselves, and/or (b) surrender all or part of their ARNT to the CAO, through the AZ ISA, in exchange for an equivalent amount of ATC to be redesignated as RNITS. The AZ ISA will send the final results of the trades and exchanges to the CAOs by 1600 hours two days before the Schedules will be implemented.
- 4.5 Each day, each SC will submit simultaneously to the AZ ISA and CAO its hourly Balanced Schedules for the next day and hourly forecasts for the following six days. The Schedules must be consistent with the ARNT information submitted to the CAO by the AZ ISA. These schedules and forecasts will be used by the CAO to update hourly ATC on the OASIS for the next seven days.
- 4.6 Changes to system configuration  
Whenever system configurations change such that the Import Limits or Local Generation Requirements change, each SC's ARNT and share of Local Generation Requirements will also change accordingly. Allocation factors (Section 4.3.4) will remain the same.

**Note:** All allocations, Schedules, and forecasts forwarded to a CAO by the AZ ISA shall be provided per SC, by path, by hour.

## **VI. Scheduling Protocol**

### **1. Purpose**

The purpose of this Protocol is to define the processes and requirements for scheduling for Retail Network Load, which is the process of arranging for the delivery of energy from one location to another over a specified transmission path.

Each SC will schedule for the Retail Network Load for which it is responsible. In addition, each SC will be responsible for making necessary transmission reservations, establishing its Schedules for Retail Network Resources, and ensuring that the amount of Retail Network Resources delivered matches the Retail Network Load for which the SC is scheduling.

Each CAO will be responsible for assessing and approving or denying the Schedule based on established reliability criteria and adequacy of transmission. Energy transactions may be scheduled by SCs, but shall only be implemented by and between Control Areas.

The AZ ISA will be copied by the SCs and CAOs on all communications and decisions on all Schedules and Schedule changes. In the event of a disputed scheduling decision, the AZ ISA will initiate appropriate dispute resolution procedures.

- All Schedules must comply with WSCC and NERC procedures and guidelines.
- All Schedules must be stated in increments of 1,000 kW (1MW) per hour.

### **2. Parties**

The Scheduling Protocol applies to the following entities:

- 2.1 Scheduling Coordinators (SCs)
- 2.2 Control Area Operators (CAOs)
- 2.3 AZ ISA

### **3. Balanced Schedules**

An SC is deemed to have submitted a Balanced Schedule when the sum of the SC's hourly Schedules for Retail Network Resources, including the scheduled purchase of Must-Offer Generation, measured in whole MWs, equals the SC's forecast of Retail Network Load, adjusted for losses, measured in whole MWs, with respect to all entities for which the SC schedules.

SCs must submit a Balanced Schedule for each Load Zone. A Schedule that is not balanced will be considered Non-Compliant.

#### **4. Must-Run Generation Requirements**

If the CAO's forecasted total Retail Network Load and wholesale load for the Load Zone is anticipated to require the scheduling of Must-Run Generation, each SC's share of the Local Generation Requirements shall be identified<sup>4</sup>, pursuant to the Must-Run Generation Protocol.

Local generators can schedule outside the Load Zone without committing by the 15th day of the month ahead. However, while this generation may result in increased ATC into the Load Zone, the Must Offer obligation will not change.

#### **5. Validation**

Each CAO will check all Schedules submitted by the SCs to verify that the following criteria are met by the SCs:

- 5.1 Schedules for each SC are balanced for Retail Network Loads and Retail Network Resources within each Load Zone
- 5.2 Retail Network Resource Schedules that are defined to be firm for the purposes of calculating an SC's Ancillary Service requirements are associated with firm transmission paths
- 5.3 NERC tags are accurate
- 5.4 Retail Network Resource Schedules on a given transmission path do not exceed the SC's ARNT and/or acquired transmission rights on that path.

#### **6. Time Lines**

The CAO may implement any temporary variances of timing requirements contained in this Protocol (including the omission of any step) if required for reliability purposes or due to technical difficulties beyond the CAO's control. The CAO will post information on the timing requirements variance on its OASIS/website as soon as practicable, and will include the following information:

- The exact timing requirements affected;
- Details of any substituted timing requirements;
- An estimate of the period for which this waiver will apply; and
- Reasons for the temporary variance.

##### **6.1 Pre-Scheduling Timeline**

---

<sup>4</sup> In the Initial Features, each SC's share of the total Local Generation Requirement will be identified by the CAO. This function will be performed by the AZ ISA in the Ultimate Features

The pre-scheduling period starts at 1800 hours two days ahead of Schedule implementation and ends at 1400 hours on the day ahead of Schedule implementation, at which time the CAO begins the pre-Schedule checkout process. Upon completion of the pre-Schedule checkout process, ATC will be recalculated.

## **6.2 Two Days Ahead**

By 1800 hours two days ahead of Schedule implementation (for example, by 1800 hours on Monday for Wednesday), the CAO will publish on its OASIS/website the following information for each hour of the Schedule implementation:

- 6.2.1 A forecast of conditions within the CAO's Control Area, including CAO transmission line and other transmission facility outages, updating ATC accordingly;
- 6.2.2 A forecast of total Control Area Load;
- 6.2.3 Total Control Area Local Generation Requirements.

## **6.3 Day Ahead**

- 6.3.1 By 0600 hours on the day ahead of Schedule implementation (for example, by 0600 hours on Tuesday for Wednesday Schedule implementation), the CAO will update all data that has changed from the two day ahead forecasts.
- 6.3.2 By 0630 hours, each SC will provide to the CAO, via e-mail or some other electronic means agreed to by the CAO and SC, a forecast of its hourly Retail Network Load by Load Zone.
- 6.3.3 By 0800 hours, each SC must submit to the CAO its initial Local Generation Schedule, which must meet or exceed its share of Local Generation Requirements.
- 6.3.4 By 1000 hours, each SC must submit to the CAO any adjustments to its purchase of Must-Offer Generation.
- 6.3.5 By 1400 hours, for each hour of the Schedule implementation:
  - 6.3.5.1 Each SC will submit its day ahead Balanced Schedule, including the appropriate NERC tags and the required adjustments to Must-Take Generation quantities, via e-mail or some other electronic means agreed to by the CAO and SC;
  - 6.3.5.2 Each SC will submit its forecast for its share of Retail Network Load for the succeeding six (6) days to the CAO and the AZ ISA via e-mail or

some other electronic means agreed to by the CAO and SC.

- 6.3.5.3 Each SC will submit its Schedules for self-provided Ancillary Services, if any, to the CAO and the AZ ISA via e-mail or some other electronic means agreed to by the CAO and SC.

#### 6.4 Validation

The CAO will check the Schedule submittals to verify that each SC has met the following criteria:

- Each Schedule is balanced within each Load Zone
- Each Schedule has a firm transmission path associated with a firm energy schedule
- NERC tags are accurate

6.4.1 By 1600 hours on the day ahead of Schedule implementation and for each hour of that Schedule implementation, the CAO will:

- 6.4.1.1 Validate all SC-submitted day ahead Balanced Schedules;
- 6.4.1.2 Notify SCs of errors discovered with their Schedules during validation;
- 6.4.1.3 Validate all SC-submitted Schedules for self-provided Ancillary Services which were part of their day ahead Balanced Schedules;
- 6.4.1.4 Notify SCs of any Local Generation Requirements which the SC has failed to include in day ahead Schedules but which CAO requires to run in the day of Schedule implementation.

6.4.2 By 1630 hours, each SC must submit a revised Schedule to correct any errors reported to it by the CAO.

6.4.3 By 1700 hours, the CAO will validate Schedule corrections submitted by each SC at 1630 hours. If the SC doesn't meet all validation criteria, the SC is in a Non-Compliant Condition. This condition may result in rejection of the SC's Schedule by the CAO, at the CAO's discretion. A rejected Schedule shall result in the release of the ARNT associated with the rejected schedule to the CAO in order for the CAO to serve the SC's Retail Network Load. Rejected Schedules will be set to zero for the purpose of calculating charges for Energy Imbalance Service.

6.4.4 The CAO will coordinate with adjacent Control Areas on the net Schedules between the CAO's Control Area and such other Control Areas. If the CAO and the operator of an adjacent Control Area have different records with respect to the net Schedules, individual SC Schedules will be examined. If required, the CAO will notify an SC of problems with its Schedule related to net Schedules between Control Areas. The affected SCs will be required to correct their Schedules.

6.5 Current Day/Real-time Scheduling

6.5.1 By 1 hour and 15 minutes prior to the Schedule hour, each CAO will update its Control Area load forecast for the next four hours following the current hour.

6.5.2 By 45 minutes prior to the Schedule hour, each SC may submit Schedule changes to the CAO. For Schedule increases, the SC must acquire ATC to designate as RNITS. Such ATC will be made available on a first-come-first-served-basis.

6.5.3 By 30 minutes prior to the Schedule hour, each CAO will begin the checkout process between the adjacent Control Areas and notify SCs of any scheduling discrepancies.

6.5.4 By 20 minutes prior to the Schedule hour, each CAO will complete Schedule checkouts with adjacent Control Areas and notify SCs of rejected Schedules and reasons for the rejection.

6.5.5 At 10 minutes prior to the Schedule hour, the CAO will begin the ramp.

**7. Loss Factors**

Each CAO will determine the Loss Factors for use by the SCs in preparation of Schedules and by the CAO for settlement. Loss Factors will be published on the CAO's OASIS/website on or before the 15<sup>th</sup> of every month for each hour of the following month.

**8. Existing Agreements**

Scheduling of Existing Agreement energy transactions shall be performed by the parties to such Existing Agreements in accordance with their provisions.

**9. Scheduling Ancillary Services Resources**

9.1 An SC that chooses to have the CAO provide Ancillary Services will not be required to schedule the Ancillary Services with the CAO.

- 9.2 For the following Ancillary Services, the SCs may self-provide all or a portion of their requirements for each of the services:
- 9.2.1 Regulation and Frequency Response Service – An SC that elects to self-provide its Regulation and Frequency Response Service obligation must use a Dynamic Schedule.
  - 9.2.2 Operating Reserves: Spinning Reserve Service – An SC that elects to self-provide all or a portion of its Spinning Reserve Service obligation to the CAO must meet all SRSG, NERC and WSCC requirements and the following criteria:
    - 9.2.2.1 The provider of Spinning Reserve Service generation is responsible for scheduling or arranging for the scheduling of the minimum energy output of generation located within the Control Area. When, by arrangement, the SC is the responsible party, it shall schedule appropriately the minimum output of the generation required to provide its Spinning Reserve Service obligation.
    - 9.2.2.2 Under normal operating conditions, the SC cannot change the point(s) of receipt for delivery of its Spinning Reserves in the day ahead market. In the event of a system emergency, the point(s) of receipt for delivery of Spinning Reserves may be changed if approved by the CAO and the SC has obtained firm transmission for this.
    - 9.2.2.3 The CAO will reduce the quantity of the Spinning Reserve Services it competitively procures by the corresponding amount of the Spinning Reserve Services self-provided by the SCs.
  - 9.2.3 Operating Reserves: Supplemental Reserves Service – An SC that self-provides all or a portion of its Supplemental Reserves Service obligation to the CAO must meet all SRSG, NERC and WSCC requirements and the following criteria:
    - 9.2.3.1 Under normal operating conditions, the SC cannot change the point(s) of receipt for delivery its Supplemental Reserves in the day ahead market. In the event of a system emergency, the point(s) of receipt for delivery of Supplemental Reserves may be changed if approved by the CAO and the SC has obtained firm transmission for this.
    - 9.2.3.2 The CAO will reduce the quantity of Supplemental Reserves Services it competitively procures by the

corresponding amount of the Supplemental  
Reserves Service(s) self-provided by the SCs.

## **VII. Ancillary Services Protocol**

### **1. Purpose**

The purpose of this Protocol is to specify the obligations of the SCs and CAOs concerning the provision of Ancillary Services to support retail transactions in a competitive market. All Ancillary Services must meet all applicable FERC, NERC, WSCC and SRSG criteria.

### **2. Parties**

The Ancillary Services Protocol applies to the following entities:

- 2.1 Scheduling Coordinators (SCs)
- 2.2 Control Area Operators (CAOs)
- 2.3 Third party Ancillary Services providers
- 2.4 AZ ISA

### **3. FERC Ancillary Services**

- 3.1 FERC has identified six Ancillary Services that are required for open access transmission:
  - 3.1.1 Scheduling, System Control and Dispatch Service
  - 3.1.2 Reactive Supply and Voltage Control from Generation Sources Service
  - 3.1.3 Regulation and Frequency Response Service
  - 3.1.4 Energy Imbalance Service
  - 3.1.5 Operating Reserve – Spinning Reserve Service
  - 3.1.6 Operating Reserve – Supplemental Reserve Service
- 3.2 Pursuant to FERC Order 888, the CAO shall be the sole supplier of the following services for loads served within its Control Area, i.e., SCs must purchase these from the CAO:
  - 3.2.1 Scheduling, System Control and Dispatch Service
  - 3.2.2 Reactive Supply and Voltage Control from Generation Sources Service

Charges for these services will be pursuant to the CAO's OATT.

- 3.3 For the following Ancillary Services, an SC may purchase them from the CAO pursuant to the CAO's OATT, or may self-provide all or a portion of its requirements:
- 3.3.1 Regulation and Frequency Response Service: The Regulation and Frequency Response requirement will be per the CAO's OATT. An SC may obtain this service from the CAO, may self-provide it, or may purchase the service from a third party in the amount specified in the CAO's OATT.
  - 3.3.2 Energy Imbalance Service: SCs will incur charges pursuant to the AZ ISA Energy Imbalance Protocol.
  - 3.3.3 Operating Reserve – Spinning Reserve Service: The Spinning Reserve requirement will be as provided by the CAO's OATT. Any SRSG, NERC or WSCC penalties imposed upon the CAO due to an SC not meeting its Spinning Reserves obligations will be passed on to the SC. An SC may obtain this service from the CAO, may self-provide it, or may purchase the service from a third party in the amount specified in the CAO's OATT. When self-providing or purchasing this service from a third party, the SC will allow the CAO to call upon the Spinning Reserves when required. The SC's Spinning Reserve obligations will not be reduced by any firm purchases.
  - 3.3.4 Operating Reserve – Supplemental Reserve Service: The Supplemental Reserve requirement will be as provided by the CAO's OATT. Any SRSG, NERC or WSCC penalties imposed upon the CAO due to an SC not meeting its obligations will be passed on to the SC. An SC may obtain this service from the CAO, self-provide it, or purchase the service from a third party in the amount specified in the CAO's OATT. When self-providing or purchasing this service from a third party, the SC will allow the CAO to call upon the Supplemental Reserves when required. The SC's Supplemental Reserve obligations will not be reduced by any firm purchases.

#### **4. Transmission Requirements for Self-Provision**

The SC that self-provides Ancillary Services is responsible for reserving the firm transmission required to allow delivery of service to and within the Control Area. An SC that uses transmission service from outside the host Control Area to deliver Ancillary Service is responsible for acquiring the necessary contracts for firm transmission service from the outside Control Areas. If the CAO is able to reduce its reservation of transmission capacity for Ancillary Services when an SC self-provides these services, the SC will be afforded an opportunity to apply this freed-up transmission

capacity toward meeting its transmission requirement for its self-provided Ancillary Services. Transmission reserved for Ancillary Services will only be used for those Ancillary Services. As an SC modifies the resources associated with its self-provision of Ancillary Service, it will modify its required transmission reservations accordingly.

## **5. Interface Requirements for Self-Provision**

An SC desiring to self-provide Ancillary Services must have in place a separate agreement between itself, the CAO and the resource provider for the provision of these services. Additionally, the SC must have in place necessary infrastructure and procedures specified under such an agreement before the SC will be allowed to self-provide.

## **VIII. Must-Run Generation Protocol**

### **1. Purpose:**

The purpose of this Protocol is to provide a framework and process governing the access to energy from Must-run Generation resources to support retail transactions in a competitive market. During certain hours, load within a Load Zone may exceed the Import Limit on the transmission system. For such hours, each SC's Allocated Retail Network Transmission (ARNT) will be insufficient to serve 100 percent of the SC's share of Retail Network Load in the Load Zone through imports alone. Such conditions will require that Local Generation be made available to SCs. For each SC, the difference between its share of Retail Network Load in the Load Zone and its ARNT will be specified in advance, and will be the SC's Local Generation Requirement. Local Generation providers that have facilities with Must-Offer Generation obligations that commit to run and commit to schedule *outside* the Load Zone will decrease the Local Generation Requirement on a MW for MW basis. The specification of the SC's share of the Local Generation Requirement will occur concurrently with the steps taken in the administration of Ultimate Features or Initial Features of the ARNT Protocol, whichever is in effect. The Must-Run Generation Protocol will be phased in, consistent with the phase-in of the ARNT Protocol

### **2. Parties**

The Must-Run Generation Protocol applies to the following entities:

- 2.1 Control Area Operators (CAOs)
- 2.2 Scheduling Coordinators (SCs)
- 2.4 Local Generation provider(s)
- 2.5 AZ ISA

### **3. Local Generation Management Options for Must-Run Generation Requirements**

Each SC must manage its obligation to provide its share of the Local Generation Requirement by:

- 3.1 Scheduling Discretionary Local Generation;
- 3.2 Purchasing Must-Offer Generation;

- 3.3 Acquiring ARNT into the Import-Limited Zone from another SC<sup>5</sup> (when such transactions are permitted under the Ultimate Features of the ARNT Protocols);
- 3.4 Implementing dispatchable direct retail load-tripping within the Load Zone (which reduces Retail Network Load within the Load Zone, and thus reduces the SC's share of Local Generation Requirement); or
- 3.5 Some combination of Sections 3.1 through 3.4 above.

#### 4. Must-Run Generation Framework

- 4.1 The Must Run Generation Protocol is applicable to the following Import-Limited Load Zones:
  - SRP Phoenix
  - APS Phoenix
  - Tucson
  - Yuma
- 4.2 For each Import-Limited Load Zone, the CAO will determine the total Local Generation Requirement for each hour, which will be equal to the forecast Retail Network Load within the Import-Limited Load Zone minus the Import Limit. Local Generation providers that have facilities with Must-Offer Generation obligations that commit to run and commit to schedule *outside* the Load Zone will decrease the total Local Generation Requirement on a MW for MW basis.<sup>6</sup>
- 4.3 Each SC scheduling into an Import-Limited Load Zone will be assigned a share of the total Local Generation Requirement for each hour. Each SC's Local Generation Requirement will be specified in advance, concurrent with the specification of its ARNT.
- 4.4 Each SC's share of the total Local Generation Requirement will be equal to that SC's Retail Network Load within the Import-Limited Load Zone minus the SC's ARNT into that same zone.
- 4.5 Each SC must meet its share of the Local Generation Requirement by taking one or more of the five actions identified in Section 3 of this Protocol.
- 4.6 For each Import-Limited Load Zone, the provider of Must-Run Generation service (e.g., CAO) must provide the amount of Must-

---

<sup>5</sup> Note: The SC providing the additional ARNT will be causing its own share of the Local Generation Requirement to increase, all things equal.

<sup>6</sup> Local Generation providers that have Local Generation facilities with *no* Must-Offer Generation obligations that commit to run and commit to schedule outside the Load Zone may make it possible for imports into the Load Zone to be increased; however, unless such Local Generation facilities are committed to meet Local Generation Requirements in the event that the export is reduced, any increase in transmission imports could only be made if such transmission were recallable.

Offer Generation scheduled by SCs, up to the amount of the total Local Generation Requirement. Must Offer Energy is provided at regulated prices as described in Sections 4.8 and 4.9 of this Protocol.

- 4.7 Each SC will be given the opportunity to purchase Must-Offer Generation up to the amount of the SC's share of the Local Generation Requirement.
- 4.8 Recovery of Must-Run Generation Fixed Costs occurs via a transmission or distribution surcharge assessed to end-use customers. Must-Run Generation Fixed Costs are the Fixed Costs associated with specific Must-Run Generation units. Must-Run Generation Fixed Costs will be limited to the percentage of each Must-Run Generation unit's annual usage<sup>7</sup> that is attributable to providing Must-Run Generation service.
- 4.9 Recovery of Must-Run Generation Variable Costs occurs via SC purchases of Must-Offer Generation.<sup>8</sup> These purchases will take place using a regulated pricing mechanism that reflects the actual Variable Cost of Must-Run Generation within each Load Zone, for each hour, as it is dispatched in the most economic sequence permitted by system conditions.

## 5. **Must-Run Generation Protocol Sequence**

### 5.1 Initial Features<sup>9</sup>

Initial Features are the same as the Ultimate Features, except:

- 5.1.1 There is no trading of ARNT among SCs.
- 5.1.2 SCs' ARNT and shares of the Local Generation Requirement are specified and communicated to the SCs by the CAO six (6) days ahead of the Schedule day. Local Generation providers that have facilities with Must-Offer Generation obligations that commit to run and commit to schedule *outside* the Load Zone by seven (7) days ahead of the Schedule day will decrease the total Local Generation

---

<sup>7</sup> Note: In certain circumstances, a generation facility that is needed for Must-Run Generation purposes on a first-contingency basis may have a total annual usage of zero. When such a generation facility is used, the owner of the generation facility will not be precluded from recovering appropriate Must-Run Generation Fixed Costs.

<sup>8</sup> Note: Prior to December 31, 2000, SRP will recover Must Run Generation Variable Costs through end-user charges.

<sup>9</sup> The Initial Features in the SRP distribution territory will differ from the description here in the following ways: (1) ARNT *can* be traded among SCs, (2) ARNT is allocated day-ahead instead of six days ahead, and (3) Local Generation Requirements are not identified for individual SCs. Instead, each SC's ARNT is kept equal to its load and any required Local Generation is scheduled by the Standard Offer SC, with the net incremental costs being allocated to all end-use customers in the Load Zone.

Requirement. If there are changes in system conditions, the Local Generation Requirement may be modified subject to the provisions of Section 5.2.5 of this Protocol.

- 5.1.3 Each SC's hourly share of the Local Generation Requirement will be determined as follows: For hours for which a non-zero Local Generation Requirement is anticipated, the CAO will divide each SC's previous day total Retail Network Load Schedule for the Load Zone for each hour by the total Retail Network Load in the Load Zone for that hour. The resulting percentage will be used to determine the SC's share of the Local Generation Requirement for the corresponding day and hour of the subsequent week.

## 5.2 Ultimate Features

### 5.2.1 Month-Ahead

Pursuant to Section 4.3 of the ARNT Protocol, the initial monthly allocation of ARNT and share of Local Generation Requirement for each SC shall be completed by the 15<sup>th</sup> day of the month ahead. Local Generation providers that have facilities with Must-Offer Generation obligations that commit to run and commit to schedule *outside* the Load Zone by the 15<sup>th</sup> day of the month ahead will decrease the Local Generation Requirement on a MW for MW basis. When such occurs, ARNT into the Load Zone is increased by the amount of the reduction in the total Local Generation Requirement and is included in the initial allocation of ARNT to SCs<sup>10</sup>. Concurrently, the Must-Offer Generation obligation of the Local Generation provider is reduced MW for MW; however, should the Local Generation provider's export of energy be reduced for any reason, the Must-Offer Generation obligation will be restored in the amount of the export reduction.

### 5.2.2 Ongoing Through Two Days Ahead

As ARNT is traded among SCs, each SC's share of the Local Generation Requirement will change to reflect the SC's amended ARNT. These changes are tracked by the AZ ISA.

---

<sup>10</sup> ARNT can be allocated up to the lesser of : (1) Total ARNT plus ATC, or (2) the Import Limit, considering exports.

### 5.2.3 Two Days Ahead

By 1600 hours two days ahead of Schedule implementation, the AZ ISA will submit the final results of the trades and exchanges of ARNT and each SC's share of Local Generation Requirements to the CAO. The CAO shall update OASIS accordingly.

### 5.2.4 Day Ahead

Each SC will submit its Balanced Schedule pursuant to Section 6.3 of the Scheduling Protocol, which must meet or exceed its share of the Local Generation Requirement and must specify the its intended purchase of Must-Offer Generation. Must-Offer Generation made available to an SC is capped at the SC's share of the Local Generation Requirement. An SC may schedule Discretionary Local Generation and/or reduce its share of Retail Network Load within the Load Zone through dispatchable direct retail Load tripping.

### 5.2.5 Ongoing up to the Schedule hour.

#### 5.2.5.1 Changes in System Conditions

Whenever system conditions change such that the Import Limit or total Local Generation Requirement change, the SC's ARNT and share of the Local Generation Requirement change in accordance with the system changes. Allocation factors (calculated pursuant to Section 4.3.4 of the ARNT Protocol) will remain the same. Changes in system conditions may cause Must-Offer Generation obligations to be increased, but not reduced.

#### 5.2.5.2 Increased Exports by Must-Offer Generation Providers after ARNT is Allocated

If Local Generation providers that have facilities with Must-Offer Generation obligations schedule *outside* the Load Zone after ARNT is allocated, it may result in an increase in ATC into the Load Zone, but will not decrease the Must-Offer Generation obligation of the Local Generation provider.

---

## **IX. Energy Imbalance Protocol**

### **1. Purpose**

The purpose of this Protocol is to establish procedures for the accounting, after-the-fact trading and settlement for Energy Imbalance Services.

### **2. Parties**

The Energy Imbalance Protocol applies to the following entities:

- 2.1 Scheduling Coordinators (SCs)
- 2.2 Control Area Operators (CAOs)
- 2.3 Utility Distribution Company(ies) (UDCs)
- 2.3 AZ ISA

### **3. Principles**

- 3.1 Standard Offer SCs (SCs for bundled retail loads) will be treated somewhat differently than Competitive SCs during the transition period to 100% retail direct access in Arizona. It is intended that the Standard Offer SCs' unique benefits and burdens will neither advantage nor disadvantage them in the competitive marketplace during the transition period.
  - 3.1.1 Standard Offer SCs will not have the same metering requirements or Energy Imbalance burdens as Competitive SCs.
  - 3.1.2 Standard Offer SCs will have the burden of responsibility as "providers of last resort" or as the only providers of Energy Imbalance Services required for the CAOs to comply with WSCC reliability requirements.
- 3.2 All settlements for Energy Imbalance will be determined on an hourly basis.
- 3.3 Pricing of Energy Imbalance Service will be in accordance with Section 5.3 of this Protocol.
- 3.4 Settlement for Energy Imbalance Service will be in dollars.
- 3.5 Until a mechanism is in place for the trading of Energy Imbalances, settlement will be between the CAO and each Competitive SC. After a Trading Entity is formed and a mechanism is in place to provide for the trading of Energy Imbalances, the CAO will settle with the Trading Entity.

- 
- 3.6 If a Competitive SC's scheduled Retail Network Resource is located within the CA and is equipped with properly functioning metering and telemetering as required by the CAO for dynamic reads, and if the owner of the Retail Network Resource has an interconnection agreement with the CAO, then the output of this Retail Network Resource can be treated as a Dynamic Schedule for the Competitive SC's share of Retail Network Load within the CA. This Dynamic Schedule would still be subject to final reconciliation of the billing meters.

#### 4. Energy Imbalance Service

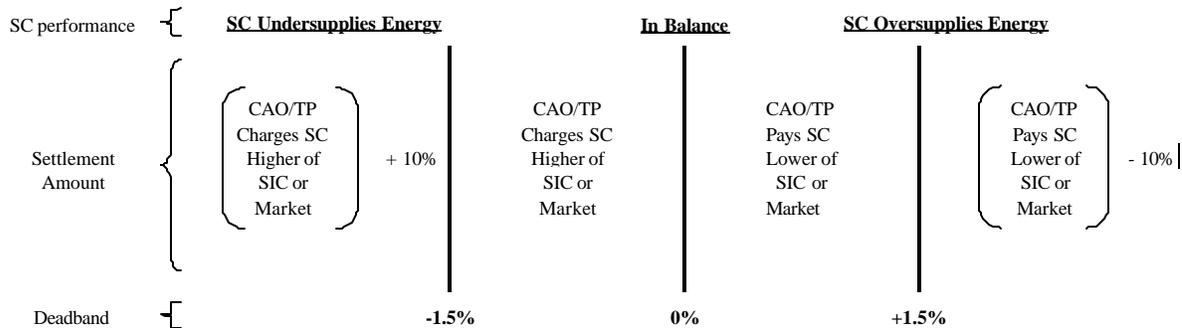
Energy Imbalance Service supplies any mismatch between a Competitive SC's Schedule and its share of Retail Network Load being served in the CA. This enables a settlement process that assigns payments or penalties, or both, to compensate for mismatches. While Energy Imbalance is principally a measurement for commercial settlement purposes, it is important for system reliability. The CAO maintains the system in balance on a real-time basis and can do so only to the extent that all users of the transmission system provide accurate Schedules and adhere to those Schedules. Consequently, Competitive SCs are encouraged, through financial incentives, to maintain interchange transactions accurately and to minimize Energy Imbalances. Energy Imbalance is a measurement necessary to ensure that users do not lean on the transmission system.

#### 5. Basis for Energy Imbalance Charges

- 5.1 Each Competitive SC's hourly Energy Imbalance will be calculated as the SC's  $[R_{\text{Actual}} - L_{\text{Actual}}]$ , where:
- 5.1.1  $R_{\text{Actual}}$  = the SC's actual Retail Network Resources scheduled into the CA (includes integrated hourly generation within the CA plus imports from other CAs)
- 5.1.2  $L_{\text{Actual}}$  = the SC's actual share of Retail Network Load within the CA (integrated hourly demand for the SC's share of Retail Network Load, based on both interval-metered Load and load-profiled Load), including the CAO's applicable calculated transmission and distribution losses.
- 5.2 Competitive SCs that have met their Operating Reserve obligations, and whose imports into the CA and/or Retail Network Resources within the CA are reduced due to unplanned forced curtailments, will not incur Energy Imbalance penalties during the period prior to the first opportunity to update Schedules. Energy Imbalance for this period will be treated as being within the

deadband, provided that the Competitive SC's Schedule(s) for the period of the unplanned curtailment fall within the deadband.

- 5.3 The basis upon which charges for Energy Imbalance Service charges were developed is shown below, where the deadband referenced is a percentage of the total Retail Network Load within the Control Area, including both Competitive SCs' and Standard Offer SCs' shares of total Retail Network Load:



If a Competitive SC undersupplies and its Energy Imbalance is within the aggregate 1.5% deadband, the CAO will charge the Trading Entity (see Section 6 of this Protocol), which will in turn charge the Competitive SC, the higher of the CAO's SIC or the Market Price. If a Competitive SC undersupplies and its Energy Imbalance is outside the deadband, the CAO will charge the Trading Entity, which will in turn charge the Competitive SC, the higher of the CAO's SIC or Market Price, plus ten percent (10%).

If a Competitive SC oversupplies and its Energy Imbalance is within the aggregate 1.5% deadband, the CAO will pay the Trading Entity, which will in turn pay the Competitive SC, the lower of the CAO's SIC or the Market Price. If a Competitive SC oversupplies and its Energy Imbalance is outside the deadband, the CAO will pay the Trading Entity, which will in turn pay the Competitive SC, the lower of its SIC or the Market Price, less ten percent (10%).

## 6. Trading of Energy Imbalance Accounts

### 6.1 Initial Features

Until the Competitive SCs and other market participants develop a Trading Entity for trading their Energy Imbalances, each CAO will perform Energy Imbalance settlement accounting with each Competitive SC using individual SC data provided to the Competitive SCs. The CAO shall calculate hourly Energy

---

Imbalances for individual Competitive SCs in accordance with its OATT and shall charge the Competitive SCs for Energy Imbalance Service pursuant to the table in Section 8 of this Protocol.

Payment to or from the CAOs for energy under or oversupplied by Competitive SCs will be in dollars.

## 6.2 Ultimate Features

Competitive SCs will be provided the opportunity to trade their Energy Imbalance accounts as part of the settlement process. A Trading Entity may be established to be responsible for final Energy Imbalance settlement with the CAO on the net hourly Energy Imbalance for the Control Area. The Trading Entity will also be responsible for final settlements with the Competitive SCs for their respective allocations of the net hourly Energy Imbalance for the Control Area.

Procedures for the trading of Energy Imbalances among the Competitive SCs within the Trading Entity shall be developed by the SCs under AZ ISA oversight. However, the Trading Entity will be separate from the AZ ISA and the Competitive SCs will be responsible for its costs.

The Trading Entity will enter into an agreement with the CAOs to facilitate billing and settlement of Competitive SC Energy Imbalances. Pursuant to its agreement with the CAOs, the Trading Entity will be subject to the creditworthiness requirements under each CAO's respective OATT.

Payment to or from the CAOs for energy under or oversupplied by Competitive SCs will be in dollars.

## 7. Ultimate Features Energy Imbalance Calculation

Within sixty (60) days after the last day of the month, each CAO shall provide the following information to each Competitive SC and the Trading Entity for each hour of the month:

- the SC's share of Retail Network Load
- the SC's scheduled Retail Network Resources
- the SC's Energy Imbalance
- the CAO's net Control Area Energy Imbalance
- the CAO's SIC and the Market Price, and
- the CAO's "beyond the deadband" Energy Imbalance charge.

The process for calculating the amounts of Energy Imbalance over or undersupplied, both inside and outside the deadband, and allocation of each Competitive SC's applicable share of the hourly Energy Imbalance

---

charges and/or penalties shall be determined as shown in the following example:

<b><u>Example</u></b>	Scheduled Load (MWh)	Actual Load (MWh)	Imbalance (Pre-Trade) (MWh)	Imbalance (Post-Trade) <sup>11</sup> (MWh)
SC <sub>1</sub>	100	100	000	000
SC <sub>2</sub>	500	700	(200)	(100)
SC <sub>3</sub>	300	200	100	000
SC <sub>4</sub>	004	001	003	003
Standard Offer SC	3,000	3,000	-	-
CAO	3,904 (sum of Competitive & Standard Offer SCs' & Schedules)	4,001 (including sale of Energy Imbalance to CAO)	(097)	(097)

The 1.5% Energy Imbalance deadband (based upon the FERC pro forma OATT) is calculated based on the total scheduled Retail Network Load within the Control Area: Energy Imbalance deadband = 1.5% \* 3904 MWh of scheduled Retail Network Load ≈ 59 MWh.

This 59 MWh deadband will be applied to the collective imbalance of the Competitive SCs that are serving unbundled load: Total imbalance of SC<sub>1</sub> through SC<sub>4</sub> = 97 MWh. MWh of Energy Imbalance within the deadband = 59 MWh. MWh of Energy Imbalance beyond the deadband = [97 – 59] = 38 MWh.

As described in Section 5.3 of this Protocol, the CAO will charge the Trading Entity, which will in turn charge the collectively undersupplying Competitive SCs, the higher of the CAO's SIC or Market Price for Energy Imbalance within the deadband (in the above example, 59 MWh), and 110% of the higher of the CAO's SIC or Market Price for Energy Imbalance beyond the deadband (in the above example, 38 MWh). If the

---

<sup>11</sup>This is just one possible outcome. It is not the most efficient one, but is used for simplicity in this example.

---

Competitive SCs collectively oversupply, the CAO must pay the Trading Entity, which will in turn pay the Competitive SCs, the SIC for Energy Imbalance within the deadband and SIC less 10% for Energy Imbalance beyond the deadband.

If the CAO's SIC = \$20/MWh and "beyond the deadband" price = \$22/MWh, then the Trading Entity must pay the CAO  $\{[\$20/\text{MWh} * 59\text{MWh}] + [\$22/\text{MWh} * 38\text{MWh}]\} = \$2,016$ .<sup>12</sup>

Penalty charges (the "beyond the deadband" price) will be allocated pro rata only to those Competitive SCs whose post-trading Energy Imbalance accounts (column 5 of the Table) exceed the greater of: (i) 1 MW or (ii) 1.5% of the Competitive SC's scheduled Retail Network Load.<sup>13</sup> Thus:

For Energy Imbalance provided/consumed:

- SC<sub>2</sub> pays the Trading Entity, which in turn pays the CAO:  
\$20/MWh \* 100 MWh = \$2,000 for the extra energy consumed.
- SC<sub>3</sub> receives from the Trading Entity, which in turn receives from the CAO:  
\$20/MWh \* 3 MWh = \$60 for the extra energy provided to the grid.

For penalties at the "beyond the deadband" price, the total amount due the CAO is \$2/MWh \* 38 MWh = \$76; and the total billing determinant is the sum of the following:

- 92.5 MWh (equal to SC<sub>2</sub>'s 100 MWh imbalance – 7.5 MWh (1.5% of SC<sub>2</sub>'s scheduled load of 500 MWh)); plus
- 2 MWh (equal to SC<sub>3</sub>'s 3 MWh imbalance – minimum 1 MW deadband); which equals
- 94.5 MWh.

SC<sub>2</sub>'s pro rata share is  $[92.5/94.5 * \$76]$  and SC<sub>3</sub>'s pro rata share is  $[2/94.5 * \$76]$ , for a total of \$76.

Total payments to CAO =  $[\$2000 - \$60 + \$76] = \$2,016$ .

Competitive SCs that participate in the Trading Entity will be empowered to impose additional sanctions, upon approval of the AZ ISA Board and

---

<sup>12</sup>Alternatively, this could be viewed as purchasing all 97 MWh at the SIC of \$20, and paying a \$2 premium for the 36 MWh outside the effective deadband.

<sup>13</sup>The rationale for the 1 MW deadband is that 1 MW is the smallest increment in which schedules can be accepted, so it would be unreasonable to impose any penalties on imbalances of less than 1 MW.

---

appropriate regulatory agencies, if the Competitive SC group determines that the Energy Imbalance pricing mechanism outlined above is not sufficient to incite reasonable scheduling and operation by certain Competitive SCs and that large Energy Imbalances are creating burdens on the other Competitive SCs.

#### **8. Energy Imbalance Settlement under the Initial Features or for Stand-Alone Competitive SCs under the Ultimate Features**

Under the Initial Features, and for Competitive SCs that choose not to participate in the trading of Energy Imbalance under the Ultimate Features, each CAO will perform Energy Imbalance settlement accounting with each Competitive SC as follows:

Within sixty (60) days after the last day of the month, each CAO shall provide the following information to each Competitive SC for each hour of the month:

- the SC's share of Retail Network Load
- the SC's scheduled Retail Network Resources
- the SC's Energy Imbalance
- the CAO's net Control Area Energy Imbalance
- the CAO's SIC and the Market Price, and
- the CAO's "beyond the deadband" Energy Imbalance charge.

Each CAO shall calculate hourly Energy Imbalances for individual Competitive SCs in accordance with its OATT and shall charge the Competitive SCs for Energy Imbalance Service pursuant to the following table. Under this stand-alone calculation, each Competitive SC will be allowed a 2 MW minimum deadband.

AISAA Stand-Alone Hourly Energy Imbalance Penalty Matrix  
(Energy Imbalance Penalty Charge for Hours with Imbalance)

SC's Simple Monthly Average of the Absolute Value of Hourly Energy Imbalances  
(Percent +/- of Energy Imbalance)

Hours Outside the Deadband During the Billing Month		1.5% - 3.0%	3.01% - 5.0%	5.01% - 10.0%	10.01% - 20.0%	20.01% - 35.0%	35.01% - 50.0%	> 50.01%
	0-100 hrs	SIC/Mkt +/- 10%						
	101 - 200 hrs	SIC/Mkt +/- 11%	SIC/Mkt +/- 12%	SIC/Mkt +/- 14%	SIC/Mkt +/- 15%	SIC/Mkt +/- 20%	SIC/Mkt +/- 25%	SIC/Mkt +/- 30%
	201 - 300 hrs <sup>/8.1/</sup>	SIC/Mkt +/- 12%	SIC/Mkt +/- 13%	SIC/Mkt +/- 15%	SIC/Mkt +/- 20%	SIC/Mkt +/- 25%	SIC/Mkt +/- 30%	SIC/Mkt +/- 35%
	301 - 400 hrs <sup>/8.2/</sup>	SIC/Mkt +/- 14%	SIC/Mkt +/- 15%	SIC/Mkt +/- 20%	SIC/Mkt +/- 25%	SIC/Mkt +/- 30%	SIC/Mkt +/- 35%	SIC/Mkt +/- 40%
	> 400 hrs <sup>/8.3/</sup>	SIC/Mkt +/- 15%	SIC/Mkt +/- 25%	SIC/Mkt +/- 35%	SIC/Mkt +/- 45%	SIC/Mkt +/- 55%	SIC/Mkt +/- 65%	SIC/Mkt +/- 75%

For hours in which the Competitive SC undersupplies, the CAO will calculate the penalty from the table above based upon the higher of the CAO's SIC or the Market Price. For hours in which the Competitive SC oversupplies, the CAO will calculate the penalty from the table above based upon the lower of the CAO's SIC or the Market Price.

The CAO will assess all hourly Energy Imbalance charges for the first 100 hours in the billing month outside the deadband according to row 1 penalties. The CAO will calculate the Competitive SC's average hourly Energy Imbalance for these 100 hours and charge the Competitive SC for each hour within these 100 hours at the rate in the applicable box. If the Competitive SC incurs more than 100 hours of Energy Imbalance during a billing month, then the CAO will assess the applicable penalties as shown on each successive row. For example, for a Competitive SC that incurs Energy Imbalances outside the deadband for 101-200 hours in the billing month, the CAO will assess the penalties shown on row 2, as appropriate for the average hourly Energy Imbalance percentage; for a Competitive SC that incurs Energy Imbalances outside the deadband for 201-300 hours in the billing month, the CAO will assess the penalties shown on row 3, as appropriate for the average hourly Energy Imbalance percentage; etc.

**Note**, it is intended that the CAOs apply and the Competitive SCs pay these penalty assessments in a progressive manner; i.e., a Competitive SC that has incurred 400 hours of Energy Imbalances outside the deadband during a billing month would not be charged the penalties

---

shown on row 5 for all 400 hours. The CAO would assess and the Competitive SC would pay the penalties on row 1 for its first 100 hours; the penalties on row 2 for the next 100 hours; penalties on row 3 for the next 100 hours; and so on.

However, for Competitive SCs that are chronic abusers that continually lean on others, a second tier of penalties will be assessed, as described in Sections 8.1 – 8.3 of this Protocol, below.

- 8.1 Competitive SCs that incur hourly Energy Imbalances for 3 consecutive months, or 6 months out of the previous 12 months, outside the deadband by 201-300 hours per month shall be assessed the penalties shown on row 3 for all hours 0-300 of Energy Imbalances outside the deadband. The CAO will continue to assess the second tier of penalties until the Competitive SC has demonstrated an effort to schedule accurately by not exceeding the deadband for more than 100 hours per month for 4 consecutive months.
- 8.2 Competitive SCs that incur hourly Energy Imbalances for 3 consecutive months, or 6 months out of the previous 12 months, outside the deadband by 301-400 hours per month shall be assessed the penalties shown on row 4 for all hours 0-400 of Energy Imbalances outside the deadband. The CAO will continue to assess the second tier of penalties until the Competitive SC has demonstrated an effort to schedule accurately by not exceeding the deadband for more than 100 hours per month for 4 consecutive months.
- 8.3 Competitive SCs that incur hourly Energy Imbalances for 3 consecutive months, or 6 months out of the previous 12 months, outside the band more than 400 hours per month, shall be assessed the penalties shown on row 5 for all hours of Energy Imbalances outside the deadband. The CAO will continue to assess the second tier of penalties until the Competitive SC has demonstrated an effort to schedule accurately by not exceeding the deadband for more than 100 hours per month for 4 consecutive months.
- 8.4 Severity would be determined by the Competitive SC's average hourly Energy Imbalance for the hours 101-200.

## 9. Transmission and Distribution Loss Factors (TLFs and DLFs)

- 9.1 TLFs and DLFs will be calculated by the CAOs and UDCs and posted on or before the 15th day of the current month for the following month on each CAO's website.

- 
- 9.2 TLFs will be system-wide and each UDC's DLFs may be voltage dependent.

## 10. Unaccounted-For Energy (UFE)

If the CAO calculates UFE hourly, then:

- 10.1 Each Competitive SC's Energy Imbalance account will be adjusted for UFE before it is provided to the Competitive SC for Energy Imbalance account trading. If the Competitive SC oversupplies during an hour in which the UFE is positive or if the Competitive SC undersupplies during an hour in which the UFE is negative (i.e., the Competitive SC helps to reduce the UFE problem), then the CAO will adjust the Competitive SC's Energy Imbalance account downward and will credit the Competitive SC's UFE account. Otherwise, no UFE account adjustments will be made.
- 10.2 The CAO will charge or credit UFE to the Competitive SC at the CAO's SIC.

## 11. Comparability

If the Standard Offer SC does not act as a passive provider of last resort and actively negotiates new agreements that do not qualify as standard offer and that are priced below the standard offer tariffs then:

- 11.1 With regard to scheduling for those customers, the Standard Offer SC shall be subject to the same scheduling requirements and Energy Imbalance provisions as Competitive SCs.
- Standard offer tariffs include those approved by the ACC as Standard Offer agreements and SRP's Standard Price Plan including the Full Electric Service Requirement.
- 11.2 Disputes: Any disputes related to this comparability section shall be referred to the AZ ISA Director for resolution pursuant to ADR procedures outlined in the AZ ISA By-laws.

---

## **X. Congestion Management Principles**

### **1. Purpose**

The purpose of these Principles is to describe the process for mitigating congestion on transmission paths where capacity has been reserved for serving Retail Network Load within the CAO's Control Area. These congestion management principles will apply to SCs that are scheduling for their share of total Retail Network Load. Congestion management for wholesale transactions will continue pursuant to the CAO's OATT or the terms and provisions of Existing Agreements, whichever may apply.

### **2. Parties**

The Congestion Management principles apply to the following entities:

- 2.1. Scheduling Coordinators (SCs)
- 2.2. Control Area Operators (CAOs)
- 2.3. AZ ISA

### **3. EHV Transmission Paths**

The EHV transmission paths that currently have Committed Use reservations to facilitate the delivery of Retail Network Resources to Retail Network Load in the State of Arizona re:

- 3.1. Four Corners 230 to Four Corners 345
- 3.2. Four Corners to Cholla
- 3.3. Cholla to Pinnacle Peak/Saguaro
- 3.4. Navajo to Westwing
- 3.5. Palo Verde to Westwing/Kyrene
- 3.6. Palo Verde to North Gila
- 3.7. Mojave to Mead to Liberty
- 3.8. Westwing to South Loop/Vail
- 3.9. Saguaro to Tortolita
- 3.10. Coronado to Silver King/Kyrene
- 3.11. Four Corners to San Juan
- 3.12. San Juan to McKinley
- 3.13. McKinley to Springerville
- 3.14. Springerville to Greenlee
- 3.15. Greenlee to Vail

---

**4. Congestion Management Process**

The Allocated Retail Network Transmission (ARNT) Protocol ensures that total transmission path reservations do not exceed the TTC.

Congestion related to a Load Zone's Import Limit will be managed with Local Generation pursuant to the Must-Run Generation Protocol.

If planned maintenance results in a reduction of transmission path TTC, transmission reservations will be reduced pursuant to the CAO's OATT. RNITS will be reduced pro-rata based on each SC's then-current reservation on that affected transmission path.

Any Schedule Curtailments on a WSCC Qualified Path required by implementation of the WSCC Unscheduled Flow Mitigation Procedure will be made pursuant to that procedure.

If forced outages, Loop Flow or other unexpected system conditions reduce transmission path capability in real time, the CAOs will make transmission path Curtailments first to non-firm Schedules and, if required, to firm Schedules (wholesale and retail) on a non-discriminatory pro-rata basis, based on the Schedules on the path. The CAO will notify the AZ ISA as soon as practical of Curtailments and of the parties affected.

If an Emergency condition necessitates redispatch to relieve transmission path loading, those SCs scheduling on the transmission path and other parties with firm wholesale transmission Schedules will share the cost of the Emergency redispatch pro-rata based on their transmission path Schedules. The CAO will notify the AZ ISA as soon as practical of the Emergency redispatch condition(s) and of the parties affected.

---

## **XI. EMERGENCY OPERATIONS PROTOCOL**

### **1. Purpose**

The purpose of the Emergency Operations Protocol is to describe system conditions that warrant Emergency operations and procedures used to mitigate or eliminate those system conditions and return the electric system to a normal operating condition.

### **2. Parties**

The Emergency Operations Protocol applies to the following entities:

- 2.1 Scheduling Coordinators (SCs)
- 2.2 Control Area Operators (CAOs)
- 2.3 Utility Distribution Companies (UDCs)
- 2.4 AZ ISA

### **3. Interface Requirements**

The CAO may issue instructions and information to SCs and adjacent Control Areas during Emergency operating conditions.

- 3.1 Emergency communications shall occur via direct telephone contact.
- 3.2 Outage and Curtailment information shall be posted on the CAO's OASIS and/or the CAO's website.

### **4. Emergency Operations**

The CAO reserves the right to take whatever action, automatic or manual, is necessary to:

- 4.1 Maintain system reliability within the CAO's Control Area.
- 4.2 Fulfill the CAO's reliability obligations as part of the WSCC.
- 4.3 Comply with Emergency Operations Policies of NERC, WSCC, SRSG and their successors.

The SC's share of Retail Network Load shall be subject to all applicable emergency operation standards promulgated by NERC, WSCC, SRSG and the CAO. Emergency operation may include, but is not limited to, automatic or manual operation of under-frequency relaying equipment, load shedding equipment, and voltage reduction equipment. The CAO shall not be responsible for any financial damages incurred by an SC for any actions taken by the CAO during emergency operation.

## 5. Emergency Conditions and Curtailments

- 5.1 The CAO may curtail SC Schedules under emergency conditions. Such emergency conditions include, but are not limited to, the following circumstances:
  - 5.1.1 WSCC-mandated circumstances such as the WSCC Unscheduled Flow Reduction Procedure. The CAO will curtail Schedules based upon a WSCC predefined matrix.
  - 5.1.2 Emergency outages on any of the CAO's EHV transmission paths that impact Import Limits.
  - 5.1.3 Emergency outages of third party facilities that impact Import Limits.
- 5.2 Load shedding shall be administered in a non-discriminatory manner and within CAO's technical limitations. The CAO shall take required actions to avoid shedding Load for entities deemed critical to the community.
- 5.3 SCs will follow the CAO's instructions to aid in remedying system problems under Emergency conditions. System problems include, but are not limited to, transmission equipment overloads, system frequency or voltage conditions that are outside of safe operating ranges, and Control Area energy deficiencies.
- 5.4 After curtailing all non-firm Schedules, the CAO will share Curtailments in proportion to the then-current load ratio shares of parties scheduling into the constrained area, to the extent practical and consistent with good utility practice.
- 5.5 When Schedules have been curtailed in accordance with Section 5.1 above, affected SCs will provide modified Schedules pursuant to Section 7.5 of the Scheduling Protocol beginning the next real time Scheduling period. The Curtailment of SC Schedules will require the CAO to immediately redispatch its generation during the Curtailment period.

## 6. Management of System Emergencies

In the event of a System Emergency, the CAO will:

- 6.1 Initiate action it considers necessary to preserve or restore stable operation of the CAO's Control Area, including but not limited to:
  - 6.1.1 Committing and dispatching all necessary available generation and Ancillary Services.
  - 6.1.2 Tripping all interruptible demand designated for reliability uses.
  - 6.1.3 Initiating the public appeals process for Load Curtailment as appropriate.

- 6.1.4 Shedding Load to curtail demand on an involuntary basis.
- 6.2 Inform adjacent Control Areas as to the nature and extent of the System Emergency, in accordance with established WSCC procedures.
- 6.3 Within a reasonable period of time, inform SCs of the System Emergency and as the system is restored and stabilized.
- 6.4 Cease Emergency operations as soon as the system has been restored to normal operations and is stabilized.

## **7. Implementation of Emergency Dispatch Instructions**

- 7.1 Each SC shall respond to CAO dispatch instructions immediately upon notification during System Emergencies.
- 7.2 Non-Compliant condition: An SC that does not execute the instructions of the CAO during Emergency situations is considered to be in a Non-Compliant condition. Non-Compliance constitutes a material breach of the CAO-SC Agreement and may result in termination of the SC's rights under the Agreement.
- 7.3 Disputes: Any disputes related to emergency operations shall be referred to the AZ ISA Executive Director for resolution pursuant to ADR procedures outlined in the AZ ISA By-laws.

## **XII. AFTER-THE-FACT CHECKOUT PROTOCOL**

### **1. Purpose**

The purpose of the After-the-Fact Checkout Protocol is to establish procedures for the accounting, after-the-fact trading and settlement for Energy Imbalance Services.

### **2. Parties**

The Checkout Protocol applies to the following entities:

- 2.1 Scheduling Coordinators (SCs);
- 2.2 Control Area Operators (CAOs);
- 2.3 Third Party Suppliers; and
- 2.4 AZ ISA.

### **3. Checkout Process and Timelines**

3.1 Normal business days for the purposes of this Protocol are Monday through Friday, excluding the following holidays: New Year's Day, Martin Luther King Day, Presidents Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Friday after Thanksgiving Day and Christmas. If a holiday falls on a Saturday, it is observed on the preceding Friday. Sundays holidays are observed on the following Monday.

3.2 The CAO will select one of the following two options for its checkout process and timeline:

#### **3.2.1 Option One:**

3.2.1.1 After-the-fact checkout information shall be posted electronically. Access to the information will be limited to the parties involved in the transaction and the AZ ISA, which shall have access to all of the posted after-the-fact information.

3.2.1.2 Hourly SC Schedules will be posted electronically by the CAO within two (2) normal business days after the trading day.

3.2.1.3 Within five (5) normal business days after the later of the actual or scheduled electronic posting of the hourly Schedules, the SC will inform the CAO of any disagreement with the posted hourly Schedules. Failure by the SC to inform the CAO of a disagreement will constitute acceptance of and agreement with the hourly Schedules as

posted. The SC shall notify the CAO of a disagreement electronically, with a copy to the AZ ISA, and shall include the following information:

- Dispute date;
- Dispute hour;
- Explanation of the dispute; and
- SC contact name, phone number and e-mail address.

3.2.1.3 The CAO will acknowledge receipt of the SC's disagreement within one (1) normal business day.

3.2.1.4 The parties will endeavor to resolve the disagreement within ten (10) normal business days.

3.2.1.5 The CAO will promptly notify the SC and the AZ ISA regarding the resolution of a disagreement.

3.2.1.6 Once a month, concurrent with the CAO's issuance of the SC monthly invoice, the CAO shall notify the AZ ISA and the impacted SC(s) of any unresolved Schedule disputes and the status thereof. Monthly invoices issued by the CAO shall reflect the values posted by the CAO, unless the CAO has notified the SC of changes.

3.2.1.7 Due to the timing of the NERC inadvertent checkout process, the CAO may make changes to the previously posted Schedule data. In such instance, the CAO shall notify the SC of the changes. Within five (5) normal business days after such notification, the SC will notify the CAO and the AZ ISA of any disagreement with the changed hourly Schedules, and the parties will use the same procedures described in Sections 3.1.1.3 through 3.1.1.5 above.

### 3.2.2 Option Two:

3.2.2.1 The Schedule verification steps listed below will be completed electronically or via direct telephone communication.

3.2.2.2 After 2400 hours on each trading day, the CAO will verify with each SC the SC's total Schedules for the day.

3.2.2.3 Within five (5) normal business days after the trading day, as part of the total Control Area

checkout, the CAO will verify with each SC the individual hourly values for each of the SC's Schedules.

- 3.2.2.4 Within ten (10) normal business days after the end of the calendar month in which the trading day occurred, the CAO will contact the SC to correct any discrepancies found in the monthly Control Area checkout process.
- 3.3 The CAO will use all available information to investigate any after-the-fact Schedule disagreement with an SC, including phone recordings, tags, etc.
- 3.4 Should the CAO or SC believe that a disagreement cannot be resolved pursuant to this Protocol, either or both parties may submit the disagreement to the AZ ISA for Alternative Dispute Resolution pursuant to the By-Laws of the AZ ISA.
- 3.5 The CAO shall specify the specific electronic mode of communication for posting Schedules, disagreements, resolution and status of resolution.