ONS
2009 ANNUAL REPORT

SUMMARY

1 – INSTITUTIONAL INFORMATION

1.1 – ONS Associate Members

INSTITUTION NAME
AES Sul Distribuidora Gaúcha de Energia
AES Uruguaiana Empreendimentos
Afluente Geração e Transmissão de Energia
Alumar Consórcio de Alumínio
Alumina do Norte do Brasil
Alumínio Brasileiro
Amazônia-Eletronorte Transmissora de Energia
Ampla Energia e Serviços
Anglo American
Anglogold Ashanti Brasil Mineração
Anglogold Ashanti Córrego do Sítio Mineração
ArcelorMittal Brasil
ArcelorMittal Inox Brasil
Arembepe Energia
Artemis Transmissora de Energia
ATE II Transmissora de Energia
ATE III Transmissora de Energia
ATE Transmissora de Energia
ATE VII - Foz do Iguaçu Transmissora de Energia
Barra do Braúna Energética
Borborema Energética
Braskem
Braskem Unib-RS
Brasnorte Transmissora de Energia
Brentech Energia
Cachoeira Paulista Transmissora de Energia
Caiuá - Serviços de Eletricidade
Campos Novos Energia
Campos Novos Transmissora de Energia
Candeias Energia
Canoas Duke
Caramuru Alimentos
Carbocloro Indústrias Químicas
Castelo Energética
Castertech Fundição
CEB Distribuição
CEB Geração
Celg Distribuidora
Celg Geração e Transmissão
Cemig Distribuição
Cemig Geração e Transmissão
Centrais Elétricas Brasileiras
Centrais Elétricas Cachoeira Dourada
Centrais Elétricas de Pernambuco - Epesa
Centrais Elétricas de Rondônia
Centrais Elétricas de Santa Catarina
Centrais Elétricas do Norte do Brasil
Centrais Elétricas do Pará
Centrais Elétricas do Rio Jordan
Centrais Elétricas Matogrossense
Central Geradora Termelétrica Fortaleza
Cocal Termelétrica
Companhia Brasileira de Alumínio
Companhia Brasileira de Alumínio - Canoas
Companhia de Eletricidade do Acre
Companhia de Eletricidade do Estado da Bahia
Companhia de Energia Elétrica do Estado de Tocantins
Companhia de Geração de Energia Elétrica Tietê

Companhia de Geração Térmica de Energia Elétrica
Companhia de Interconexão Energética
Companhia de Transmissão Centroeste de Minas
Companhia de Transmissão de Energia Elétrica Paulista
Companhia Energética Chapecó
Companhia Energética de Alagoas
Companhia Energética de Pernambuco
Companhia Energética de Petrolina
Companhia Energética de São Paulo
Companhia Energética do Ceará
Companhia Energética do Maranhão
Companhia Energética do Piauí
Companhia Energética do Rio Grande do Norte
Companhia Energética Potiguar
Companhia Energética Rio das Antas
Companhia Energética Santa Clara
Companhia Energética São Salvador
Companhia Estadual de Distribuição de Energia Elétrica
Companhia Estadual de Geração e Transmissão de Energia Elétrica
Companhia Hidroelétrica do São Francisco
Companhia Luz e Força Santa Cruz
Companhia Paraibuna de Metais
Companhia Paulista de Força e Luz
Companhia Piratininga de Força e Luz
Companhia Siderúrgica de Tubarão
Companhia Siderúrgica Nacional
Companhia Transirapé de Transmissão
Companhia Transleste de Transmissão
Companhia Transudeste de Transmissão
Consórcio Candonga
Consórcio Capim Branco Energia
Consórcio Cemig-CEB
Consórcio Empresarial Salto Pilão
Consórcio EnerPeixe
Consórcio Funil
Consórcio Igarapava
Consórcio Jauru
Consórcio Paraibuna
Consórcio Porto Estrela
Consórcio Serra do Facão
Consórcio UHE Guilman Amorim
Copel Distribuição
Copel Geração
Copel Transmissão
Coqueiros Transmissora de Energia
Corumbá Concessões
Cosan Bioenergia - UTE Costa Pinto
Cosan Bioenergia - UTE Usina Rafard
CPFL Geração de Energia
Dona Francisca Energética
DSM Elastômeros do Brasil
Duke Energy International - Geração Paranapanema
EKA Bahia
Elektro - Eletricidade e Serviços
Eletrobras Termonuclear
Eletrogóes
Eletropaulo Metropolitana - Eletricidade de São Paulo
Eletrosul Centrais Elétricas
Empresa Amazonense de Transmissão de Energia
Empresa Bandeirante de Energia
Empresa Brasileira de Transmissão de Energia
Empresa Catarinense de Transmissão de Energia

Empresa de Eletricidade Vale Paranapanema
Empresa de Transmissão de Energia de Santa Catarina
Empresa de Transmissão de Energia do Oeste
Empresa de Transmissão de Energia do Rio Grande do Sul
Empresa de Transmissão do Alto Uruguai
Empresa de Transmissão do Espírito Santo
Empresa Elétrica Bragantina
Empresa Energética de Mato Grosso do Sul
Empresa Metropolitana de Águas e Energia
Empresa Norte de Transmissão de Energia
Empresa Paraense de Transmissão de Energia
Empresa Produtora de Energia
Empresa Regional de Transmissão de Energia
Enerbrasil - Energias Renováveis do Brasil
Energest
Energética Águas da Pedra
Energética Barra Grande
Energética Camaçari Muricy I
Energisa Borborema – Distribuidora de Energia
Energisa Minas Gerais
Energisa Paraíba
Energisa Sergipe
Enguia Gen BA
Enguia Gen CE
Enguia Gen PI
Espírito Santo Centrais Elétricas
Espora Energética
Expansion Transmissão de Energia
Fibraplac Chapas de MDF
Foz do Chapecó Energia
Foz do Rio Claro Energia
Furnas Centrais Elétricas
Geração CIII
Geradora de Energia do Norte
Gerdau Aços Longos - Barra dos Coqueiros
Gerdau Aços Longos - Caçu
Gerdau Aços Longos - SP
Goiana Transmissora de Energia
Ijuí Energia
Innova
Integração Transmissora de Energia
Interligação Elétrica de Minas Gerais
Interligação Elétrica Norte e Nordeste
Interligação Elétrica Pinheiros
Interligação Elétrica Sul
Investco - Lajeado
Itá Energética
Itapebi Geração de Energia
Itiquira Energética
Itumbiara Transmissora de Energia
Jauru Transmissora de Energia
Lanxess Elastômeros do Brasil
LDC Bioenergia
Light - Serviços de Eletricidade
Light Energia
Linde Gases
Londrina Transmissora de Energia
LT Triângulo
Lumitrans Companhia Transmissora de Energia Elétrica
Maracanaú Geradora de Energia
Mineração Maraca Indústria e Comércio
Mirabela Mineração do Brasil
MMX Minas-Rio Mineração
Monel Monjolinho Energética

MPX Energia
Nordeste Transmissora de Energia
Nova Era Silicon
NovaTrans Energia
Oxiteno Nordeste Indústria e Comércio
Paraíso-Açu Transmissora de Energia
Pedras Transmissora de Energia
Petróleo Brasileiro
Petróleo Brasileiro - Fábrica de Fertilizantes Nitrogenados, FAFEN-SE
PIE-RP Termelétrica
Poços de Caldas Transmissora de Energia
Porto Primavera Transmissora de Energia
Refinaria Presidente Getúlio Vargas
Retiro Baixo Energética
Ribeirão Preto Transmissora de Energia
Rio Claro Agroindustrial
Rio Grande Energia
Rio Paracatú Mineração
Rio Verde Energia
Rosal Energia
São Mateus Transmissora de Energia
Serra da Mesa Transmissora de Energia
Serra Paracatu Transmissora de Energia
Siderúrgica Barra Mansa
Sistema de Transmissão Catarinense
Sistema de Transmissão Nordeste
Sul Transmissora de Energia
Tangará Energia - Guaporé
Termelétrica Itapebi
Termelétrica Monte Pascoal
Termelétrica Viana
Termo Norte Energia
Termo Pernambuco
Termoaçú
Termocabo
ThyssenKrupp CSA Siderúrgica do Atlântico
Tractebel Energia Suez
Transmissora Sudeste Nordeste
UEG Araucária
Uirapuru Transmissora de Energia
Usina Termelétrica de Anápolis
Usina Termelétrica Norte Fluminense
Usina Xavantes
Usinas Siderúrgicas de Minas Gerais
Vale
Ventos do Sul Energia
Veracel Celulose
Vila do Conde Transmissora de Energia
Votorantim Cimentos
Votorantim Metais Níquel
White Martins

1.2 – Administration Board

Category: Production

⇒ Valter Luiz Cardeal de Souza (ELETROBRÁS) as incumbent.

The substitute is Luiz Henrique de Freitas Schnor (CGTEE);

⇒ Mozart Bandeira Arnaud (CHESF) as incumbent.
The substitute is Antonio Bolognesi (EMAE);

⇒ Fernando Henrique Schuffner Neto (CEMIG) as incumbent,
The substitute is Alexandre Magno Firmo Alves (CDSA);

⇒ Maurício Stolle Bähr (TRACTEBEL) as incumbent.
The substitute, Cesar Teodoro (DUKE) was replaced by Alcides Casado de Oliveira Junior on 09/18/2009;

⇒ Xisto Vieira Filho (TERMOPERNAMBUCO) as incumbent.
The substitute is Maria das Graças Foster (PETROBRÁS).

Category: Transport

⇒ Wady Charone Junior (ELETRONORTE) as incumbent.
The substitute is Rogério Ribeiro Abreu dos Santos (NTE);

⇒ Ronaldo dos Santos Custódio (ELETROSUL) as incumbent.
The substitute is Nelson Gravino (ARTEMIS);

⇒ Celso Sebastião Cerchiari (CTEEP) as incumbent.
The substitute is Moacir Finotti (CELG);

⇒ Elmarde Oliveira Santana (TBE) as incumbent.
The substitute, Alessandro Fiocco (TERNA), was replaced by Paulo Mota Henriques (TAESA) on 12/02/2009.

Category: Consumption

⇒ Delson Martini (CEEE) as incumbent.
The substitute is Eduardo Carvalho Sitonio (CELESC);

⇒ Wilson Pinto Ferreira Junior (CPFL) as incumbent.
The substitute, Dorel Soares Ramos (ESCELSA) was replaced by Michel Nunes Itkes on 04/16/2009;

⇒ Britaldo Pedrosa Soares (ELETROPAULO).
The substitute is Luis Fernando Guimarães (LIGHT);

⇒ Marcelo Maia de Azevedo Correa (NEOENERGIA) as incumbent.
The substitute is José Antonio Sorge (REDE);

⇒ Erico Teodoro Sommer (GERDAU).
The substitute is Vania Lucia Somavilla (VALE).

⇒ Márcio Pereira Zimmermann (MME).
The substitute is Ricardo Spanier Homrich (MME).

1.3 – Fiscal Board

⇒ Silvio Roberto Areco Gomes (CESP) as incumbent and Pedro José Diniz de Figueiredo (ELETRONUCLEAR) as substitute, representing the Category Production;

⇒ Fabio Machado Resende (FURNAS) was replaced by Cesar Ribeiro Zani (FURNAS) on 09/10/2009 as incumbent, and Humberto Gomes de Macêdo (PATESA) was replaced by Marcio Szechtman (TAESA) on 09/23/2009 as substitute, representing the Category Transport;

⇒ Rubens Ghilardi (COPEL) as incumbent and Antonio de Pádua Gonçalves Novaes (CEB) as substitute, representing the Category Consumption.

1.4 – ONS Board of Directors

Hermes J. Chipp – General Director

Darico Pedro Livi

Luiz Alberto Machado Fortunato

Luiz Eduardo Barata Ferreira

Roberto José Ribeiro Gomes da Silva

1.5 – Administration Board's Message

For an adequate and extensive view of the multiple activities in which the Brazilian Electric System Operator - ONS was involved in 2009, with the proper license for the use of analogy, it would be necessary to use a lens with variable *zoom*.

Opening it, we can focus on ONS international relationships, in its effort to formalize the establishment of the Very Large Power Grid Operators – VLPGO institution, which culminated in the approval of its bylaws this year, as well as the progress achieved regarding its main technical challenges: the preparation of a specification on phasor measurement units (PMU), the integration of additional renewable resources, the operation of high voltage systems in direct current (HVDC) and the description of he world's best restoration practices.

Closing the lens a bit, we can see the important role of the Operator in the electrical energy integration with neighboring countries, using resources from the BIPS to meet the needs of systems of Uruguay and Argentina.

Further limiting the scope of the lens, and adjusting it to the borders of the BIPS, we highlight the proper completion of the institutional functions of the Operator, with neutrality and transparency, and the improvement of the relationship with the organization's Associate Agents. Stand out in 2009, the two outputs of the meeting with Agents and Associations, on June 8th and October 7th, with a significant presence of the target audience. First, several technical and management issues were shared with participants. In the second meeting, the goal was to identify, from the perspective of Agents and Associations, which are the main challenges of the Operator for the next five years, so they were considered in strategic planning for the term 2010-2014.

Finally, closing the zoom across the boundaries of the organization, we focus on the actions for the improvement of technical processes and for management of personnel, seeking to attract, retain and develop professionals of ONS own staff. It is important to highlight the work of the Administration Board, which was, in 2009, with its balanced and representative formation of the organization Associate Members, dedicated to the analysis of management corporative indicators and to the study of the best solutions for the occupation, by ONS, of more adequate and standardized facilities in Rio de Janeiro, Florianopolis and Recife.

Despite acknowledging that not even with the use of analogy can we foresee the future, our expectation is that, with the competence of the Operator technical staff and the experience of its Board of Directors, the new challenges arising from the increasing complexity of the integrated operation of the BIPS will be addressed and overcome with the same success that has marked the trajectory of the Operator.

Maurício Stolle Bähr

ONS Administration Board's President

1.6 – General Director's Message

For the Brazilian Electric System Operator, 2009 was a year of significant results obtained with both the improvement of its participation in the agents grid and its relationship with the institutions involved in the management of the Brazilian electric system, as in the evolution of its technical and corporate processes, and in the execution of its core attributions, to manage the transmission, plan the operation and exercise it in a centralized manner, seeking to ensure security at minimum cost.

Externally, ONS has actively participated in establishing the Bylaws of the Very Large Power Grid Operators Association - VLPGO. Its proper juridical formation creates the bases for the development of joint works, sharing the costs amongst participating members, and defines a policy of exchanging information and knowledge amongst them. The stability of its operation turns the VLPGO into a privileged forum for the exchange of experiences in the management of large electric systems, which will bring great benefits to its members.

ONS also increased, in 2009, its work in the CIER with its participation in the CIER Project 15, which discusses the possible energy transactions amongst the Andean Region, Central America and South Cone. Moreover, at the meeting of the CIER Central Committee, held in November 2009 in Madrid, the General Director of ONS was conducted for the post of First Vice-President of the CIER for the period 2009/11.

On a national level, the Operator has enhanced its relationship with its 235 Associate Agents, with sector associations, with ANEEL and other regulatory agencies that relate to the sector as ANA and ANP, with EPE and CCEE, and the Ministry of Mines and Energy. At this point, it is necessary to note that the collaboration and integrated performance with all these organizations was an important factor for the positive results presented in this report. Another topic that should be given special attention to, in 2009, was the expansion of the range of institutions which participated in the elaboration of ONS strategic planning which, in the cycle from 2010 to 2014, relied on the collaboration of Associate Agents and their associations, sector authorities, regulatory agencies and strategic partners in universities, research centers and advisors.

It is also worth mentioning that, in 2009, two operational agreements of major importance to ONS were signed, with EPE and ANA, establishing new guidelines for the relationship and exchange of technical information.

Regarding the evolution of technical and corporative processes of the Operator, some topics that deserve mention, in 2009, are:

- Permanent Approval of Grid Procedures, through the Normative Resolution No. 372/09 of 08.05.2009, for the first time since they were created, which required an extensive review of these documents, motivated by the results of Public Hearings conducted by ANEEL.

- The development of methodology for calculation of energy safety indicators, which is based on references such as the Target Level, Minimum Safety Level, Risk Aversion Curve and Critical Operation Curve, which together represent an

instrument of empowerment and greater robustness of the recommendations of the annual energy planning, as well as for the decision making by CMSE regarding the guarantee of energy supply in the BIPS. We will continue working so that its rules and subsequent deployment happen throughout 2010.

- Continuity in the process of improvement of energy management planning models aiming at reducing the volatility of the marginal operation cost and, consequently, the price for the settlement of the differences in the energy market.

- Further analysis of the reduction in the number of the BIPS submarkets in order to reduce the exposure risks of the price difference between submarkets, which has been an inhibiting factor to the offer expansion in the free contracting environment.

- Improvement of the energy hydrological operation planning and programming studies, with consideration of rainfall-runoff co-relation models for the calculation of inflow forecasts to the plants and reservoirs.

- Deployment of the Special Protection and Control System which controls the shutdown of generating units at Tucurui Powerplant after shutdown of three or more units of Itaipu 60 Hz by the Emergency Control Scheme associated with the AC Link 765 kV. This particularly innovative system, in which the shutdown signal travels 3500 km, allows increasing the energy interchange to Southeast region by 700 MWmed, ensuring the integrity of the BIPS and avoiding more serious consequences to the grid's safety.

- The conclusion of international public bidding, the detailed definition of the scope and the signing of the contract with Siemens-Cepel Consortium for the design and implementation of ONS Energy Management Grid - REGER, which had already started its activities in 2009.

- The interconnection to the BIPS of isolated systems in the states of Acre and Rondonia and the continuity of studies for the interconnection of Tucurui-Manaus System;

- The efforts made increase internal integration, through important initiatives in human resources management developed last year, as the Recognition Program and Recognize + award, the active participation of employees in the evolution of the Position and Compensation Management Plan, as well as the Career Trajectories.

The continuity of energy supply was maintained, with the Southeast / Midwest region supplying a significant part of the requirements of the South during the first semester of 2009, with the need, in most critical times, to dispatch additional thermal generation. In the second semester of the year, the improvement of hydrological conditions allowed all regions to reach storage levels, in the end of the period, much higher than those recorded in 2008.

The operation of the power grid was conducted in accordance with the supply continuity, reliability and quality criteria established in the Grid Procedures. The safety in the electric service achieved in 2009 can be translated by the BIPS robustness

indicator: 96.8% of the disturbances, the load cuts were recorded below 100 MW. These indicators remained in the same levels of previous years, even taking into account the growth of the transmission grid.

We faced, on November 10th, an occurrence of large scale, with the shutdown of 40% of the total energy load of the BIPS and an average recovery time of 222 minutes in the most affected areas. Although it was an unusual triple contingency, with very low probability of occurrence, the special protection systems worked correctly and the islanding schemes prevented the spread of the problem. The North and Northeast regions had shutdowns of 7% of the load due to the performance of the Regional Load Alleviation Schemes, while in the South, almost its whole load was preserved. The analysis of the event indicated some actions to improve the BIPS safety, which are already being implemented.

Regarding the transmission administration, ONS could add more efficiency and effectiveness to the processes of access, expansion propositions and reinforcements, contract management and monthly assessment of services and charges studies.

In parallel with these measures, there was the continuity to the actions for the permanent updating of technological resources and infrastructure. In particular, further studies of the best solutions to the occupation, by ONS, of more appropriate and standardized facilities in Rio de Janeiro, Florianopolis and Recife.

Moreover, we sought to always create opportunities to improve technical training and human development of ONS staff, promoting knowledge management and technological development, with full awareness that people are, ultimately, responsible for compliance, with increasingly success, with the institutional functions of the organization. To them we give special thanks, on behalf of ONS Board of Directors.

Hermes J. Chipp

ONS General Director

2 – TECHNICAL RESULTS IN 2009

2.1 – Operation Planning and Programming

2.1.1 – Energy Management

Medium Term Analysis

Regarding the energy management annual planning, in June 2009, ONS issued the PEN 2009, which evaluated the energy supply to the BIPS on the period May/2009 – December/2013.

The analysis in the five-year horizon allows ONS to forward proposals for making strategic decisions, such as: constructions anticipations, the need for evaluation, by MME / EPE and CMSE, of the deployment of additional energy offer to the expansion program set for this period or even the establishment of reserve generation and / or energy reserve, pursuant to Law 10.848, of 03/15/2004 and Decree No. 6353 of 01/16/2008.

It is important to highlight, as one of the conclusions of the 2009 PEN, that the hydroelectricity will continue as the main source of power generation over the next five years, but the utilization of conventional thermoelectric sources such as coal, gas and oil, will increase over the period from 11, 895 MW (12.1%) to 25,267 MW (19.9%).

It is also worth mentioning that the energy supply conditions foreseen at the horizon 2009/2013 indicated the compliance to the supply criteria recommended by CNPE, since the risks of energy shortages are less than 5% in all subsystems.

As featured recommendation, the PEN 2009 brings the urgent need for assessments to quantify the cost / benefit associated with reduction of minimum flow restriction of the Sao Francisco River and / or expansion of export capacity of the Northeast region in order to ensure full use of the contracted energy in the region in 2013.

In this context, the PEN 2009 recommended that the location of new offer in 2012 and 2013, resulting from LENS A-3, 2009 and 2010 and from LER, 2009, should give priority to the South and Southeast / Midwest regions. Nevertheless, further expansions in the Northeast should be evaluated considering also the costs necessary for the expansion of export capacity of this region.

Another important recommendation was that there should be a follow-up of the planning and development of the logistics of providing oil for flexible thermal generation, so as to ensure the fuel supply for these thermal plants and their full use in situations in which they should be dispatched in order to ensure the safety of the system.

Short Term Analysis

With regard to the short-term implementation of operation programming guidelines, it should be noted that the distribution of inflows during the year 2009 in the BIPS did not occur uniformly, especially in the southern region of the country in which, in the first half, significantly reduced values, in the order of 30% of historical average, were registered.

This abnormal behavior of rainfall in the South region was previously identified by ONS, through a climate forecast analysis methodology, which allowed the adoption of operating policies that could mitigate its effects on the energy supply to the South region.

Thus, at CMSE, ONS carried out an evaluation of the energy supply conditions in the South region in 2009, concluding for the implementation, in this period of critical inputs to the region, of a safety minimum storage of 40% of its maximum storage capacity.

The complementary thermal dispatch in the South region was defined having this minimum level of storage as a reference, together with the maximization of the power supply to that region. From the second half of July, through the analysis of future climate conditions, ONS identified the reversal of the adverse hydrological framework in the South region, as reported at the CMSE meeting in May. This fact led to the gradual reduction of the complementary thermal dispatch in the South region.

The inflows to the South region remained high throughout the second half, reaching values in the order of 255% of MLT (Long Term Average) in September and resulting in an annual average of 124% of the MLT for the region.

In this context, it is important to emphasize that in the period from April to July, inflows were also not favorable in the Southeast / Midwest, demanding the implementation of complementary thermal dispatch in this region to ensure the achievement of the Target Level for November/2009, according to the existing methodology for the achievement of the safety Storage / Target Level at the end of the dry season.

However, there was also, in the SE / MW region, a significant recovery in inflows in the second semester, with the natural energy inflows reaching 181% of MLT in September, resulting in an annual average of 121% of MLT. This fact allowed the achievement of the Target Levels in November, with no need for complementary thermal dispatch.

In the North and Northeast regions, the annual average energy inflow stood at 110% and 98% of MLT, respectively.

It is also important to highlight that the combination of complementary thermal dispatch applied in the first semester with significant inflows observed in the second semester provided the filling of the BIPS storage reservoirs at the end of 2009.

The energy stored in the reservoirs of the SE / MW region reached, at the end of December, 72.6% of its maximum storage. In the Northeast, the storage has reached 65.5% at the end of the year. These values are 16.7% and 20.9%, respectively, higher than those registered at the end of 2008.

Another action that deserves mention concerns the operative strategy that was adopted during 2009, aiming at raising the storage level of Serra da Mesa hydroelectric plant's reservoir, in order to increase the BIPS regulating capacity, with benefits for the safety of the energy supply. It is worth noting that this measure was only possible from the actions that ONS has undertaken alongside Furnas, to allow operation of the generating units as synchronous compensators, which allowed the plant to minimize the generation without compromising the proper control of the 500 kV grid, to which it is connected. At the end of the year, the volume of the reservoir reached 59% of the maximum, a mark which is 20% higher than the value recorded in the last ten years.

As in previous years, there was an opportunity, in 2009, for energy integration with the electric systems of Uruguay and Argentina, with the export being effected, with resources of thermal generation not used to meet the requirements of the BIPS, complemented by hydroelectric power, through "return" mode, once the exported energy should be returned to Brazil by November 2009, as agreed between the parties.

2.1.2 – Transmission Grid Operation

Medium Term Analysis

In January 2009, ONS released the Annual Grid Operation Planning Study 2009 / 2010 PEL, which presents the evaluations of the electrical performance of the transmission grid of the BIPS in the period between January 2009 and April 2010, in accordance with the criteria and standards established in the Grid Procedures.

The PEL Study has been developed, mainly in order to evaluate: 1) the performance of regional interconnections, 2) the need for thermal generation due to transmission constraints, and 3) the power supply to areas of the BIPS.

From these assessments, the main results of 2009/2010 PEL were:

- Proposals to adapt the schedule of the transmission grid expansion work (transmission lines, transformers, etc.) to the needs of the BIPS. In this regard, management actions for the immediate implementation of projects already granted by ANEEL and the proposal for speeding up ANEEL’s authorization to a set of priority structural facilities which bring direct benefits to the performance of regional interconnections and / or to the power supply to specific areas should be emphasized.
- Indication of operational solutions such as the deployment of Special Protection Systems - SEP and the changing in the grid’s topology, such as, for example, opening of busbars. These interim solutions are justified as operational resources until the structural reinforcements and new system expansions identified in planning studies are implemented.
- Operational strategies that will be used in the BIPS operation in this horizon, to be detailed and updated in the quarterly and monthly studies, as well as in medium term energy management studies, as they apply.

ONS has been developing various actions, together with the associate agents, focused on the BIPS reliability analysis and operational electrical safety. The goal is to diagnose the main needs for improvement of the BIPS and to indicate the steps to be taken in order to revitalize existing facilities, adapting them to the safety standards prescribed in the Grid Procedures. These studies are consolidated in the System Installations Modernization Plan - PMIS, which is routed to ANEEL.

Short Term Analysis

Throughout 2009, ONS developed studies and implemented measures which enabled the operation of the electric grid in accordance with the criteria of supply continuity, reliability and quality of supply established in the Grid Procedures. Amongst these studies and measures, it is important to mention:

- The on-site implementation of adjustments resulting from the optimization of control systems of Salto Osorio and Samuel hydroelectric generating units and Termonorte II thermoelectric plant, which contributed to the damping of electromechanical oscillations;

- The design and implementation of new Special Protection and Control Systems (SEPs) as well as the revision of existing ones, reaching a total of 279 such systems installed in the BIPS.

The deployment of an SEP, which controls the shutdown of generating units at Tucurui plant after the shutdown of three or more 60 Hz units of Itaipu by the Emergency Control Scheme associated with the 765 kV Link, should also be highlighted in 2009. This particularly innovative system, in which the shutdown signal travels 3,500 km, increases the interchange to the Southeast region by 700 MWmed, ensuring the integrity of the BIPS and avoiding more serious consequences to the grid's safety.

Studies to optimize the control systems of generators, in order to ensure adequate damping of electromechanical oscillations, thus minimizing the consequences of disturbances have been developed. In these works, both the entry into operation of new plants and the topological changes of the transmission grid with the addition of new components were covered, such as the transmission line at 230 kV Jauru-Vilhena, C1 and C2, which integrates Acre / Rondonia System to the BIPS.

Also in 2009, ONS participated in working groups together with the agents and ANEEL, in a joint work with the State Departments of Energy, in order to speed up the implementation of works necessary to guarantee the power supply to specific areas in the system such as Rio Grande do Sul, Sao Paulo and Maranhao.

The BIPS is designed according to the safety criterion known as N-1, which means that, even with the unavailability of any element (single contingency), the system should be able to remain operating without interruption of power supply, loss of system stability, violation of patterns of electrical measures (frequency, voltage, harmonics, etc.) and without reaching the limits of equipment and facilities overload. In 2009, there were over 500 such contingencies involving the BIPS transmission grid. The appropriate action of the SEPs, and the good performance of control systems,

including additional signal stabilizers, ensured the operational safety of the BIPS. However, the operation of any system is subject to multiple contingencies, such as the one occurred 11/10/2009.

Improvements were made in the system restoration processes, such as new corridors for fluent load restoration, aiming at accelerating the normalization of supply after disturbances.

2.1.3 – Evolution of processes and methodological improvements

ONS promotes constant improvements of methodologies, criteria and computational models used in the operation planning and programming studies, also through the activities developed under GT2 - Working Group on Further Development of Models and Methodological evolution for Operation Planning and Programming and for the Calculation of the Market Price (PLD), with the joint coordination of the CCEE.

Aiming at the improvement of energy management models, ONS has given special attention to the reduction of the volatility of the marginal operation cost, which also affects the short-term energy market price (PLD). This issue is being addressed under the GT2/CPAMP group and involves both short and medium term actions. For the short-term, measures are being studied to combine weekly and monthly inflow forecasts, in order to mitigate variations of weekly inflows. For the medium-term, selective sampling of inflow scenarios is being considered. This study is conducted in Newave task force and is currently in the validation process, to be concluded in June 2010. Another study considering the re-sampling the tree of hydrological scenarios in order to cover a larger set of system states is expected to be concluded in the second semester of 2010.

Another issue that is being addressed within the CPAMP Commission, with the effective participation of ONS, refers to studies that seek to reduce the risk of exposure to the difference of prices between submarkets, which is an inhibiting factor for the expansion of the energy offer in the free contracting environment (ACL). This issue is being analyzed in depth, given that the reduction in the number of submarkets reduces the risk of exposure to the difference of prices for the agents participating in the ACL, but increases the system service charges. ONS suggested the evaluation of mitigation mechanisms, involving economic regulation, so that encourages the expansion of the energy offer in the ACL, without necessarily reducing the number of submarkets.

In order to support the Electric Sector Monitoring Committee - CMSE in monitoring and evaluating the continuity and safety of electricity supply in the BIPS, ONS concluded, in 2009, a methodology for calculating the Safety Indicators, which was improved with suggestions from the agents and their associations and submitted under the CMSE Working Group on Methods and Procedures for Decision Support - GT1. In 2010, the work will be focused on its regulation, after approval in CMSE, in order to allow its application within that year. The Safety Indicators proposed are based on references such as the Target Level, the Minimum Safety Level, the Risk Aversion Curves and the Critical Operation Curve. The positioning of the energy reserves regarding these references allows the establishment of normal operation condition and warning and

alarm situation in the medium term, thus providing the CMSE with an instrument for defining measures to be taken in accordance with the severity of the situation.

As part of the continuous process of improvement of the planning and programming tools, studies applying the SMAP model - Soil Moisture Accounting Procedure - for the Rio Grande basin, ranging from Camargos plant to Porto Colombia plant, have also been completed. The streamflow forecasting for this set of hydropower plants is about 20% of the Natural Energy inflow to the SE / MW subsystem. With the implementation of the SMAP model in the Rio Grande basin, which occurred in October, the coverage with rainfall-runoff models reached the mark of 32% of ENA in SE / MW. In the southern region, the rainfall-runoff models are already responsible for the forecast of 90% of the ENA in this region. In the Sao Francisco river basin, the development of the Neuro 3M model, based on neural grids, has been completed. The results of its application to inflow forecasting at Tres Marias plant was sent to ANEEL at the end of the year, in order to receive its formal authorization.

In the scope of flood control planning and operation, a new characterization of the flood control situation, in accordance with the revision of the Grid Procedures has been implemented. This new characterization includes the definition of alert and attention situations, in order to improve the flood control procedures, including with respect to the role of ONS and the generation agents. At the end of the year, high storage levels in the reservoirs of the Parana river basin and the forecast of positive anomalies of precipitation due to the occurrence of the El Nino phenomenon led to the adoption, in preliminary basis, of the wet hydrological scenario for the allocation of flood control volumes for this basin. This measure improved protection against floods downstream to the basin reservoirs.

Regarding the operational safety evaluation tools, there were, in 2009, significant advances in the use of the Organon program in the operation planning and programming studies and in real time operation. An action plan defining steps of evolution for the effective use of the safety region in the operation planning and programming studies has been established. By using real time state estimators, at least one dynamic safety region of Organon was successfully implemented in each of ONS five operation control centers, including the recently integrated Acre-Rondonia area. Based on the results achieved in the previous year, improvements in the dynamic modeling and the representation of the electric network were obtained in 2009.

2.2 – Real Time Operation

In accordance with ONS Supervision and Control Master Plan, the activities for the project and implementation of ONS Power Management Network (REGER) continued. During the year 2009, the international public bidding with the supplier selection was completed, after the phase of detailed definition of the scope (work statement), a contract with Siemens-Cepel Consortium was signed in June 2009. The test systems

and the PI / OSIsoft historical records were implemented in advance in each ONS Operation Center in November.

The project of the Brazilian System for Observability and Controllability – SINOCON, reached, in 2009, the implementation mark of 97 of the 116 remote terminal units (RTUs) foreseen in its Emergency Phase. Throughout 2009, five additional RTUs have been put in service. The results achieved with the approval of projects, in factory acceptance testing and the delivery of equipment in plants and substations indicate that at the end of 2009, the Project SINOCON fulfilled 87% of its physical accomplishment goal.

On October 27th, the 2nd Workshop on Availability and Quality of Measures was held, attended by 72 representatives of 46 agents. The results of the survey on availability and quality indicators, the operational routines and reports on the new project for improving the observability and controllability of the BIPS were presented. The event ended with a debriefing session for the agents' questions and discussions with staff representatives of ONS Operation Control.

In 2009, six drills for the rebuilding of the BIPS were also developed, with the participation of 15 invited agents in the areas of transmission, generation and distribution of energy. Systematically performed since 2006, aiming at simulating a possible scenario of disturbance in the operation of the BIPS, these drills allow an assessment of the performance of teams, processes, procedures and adequacy of resources. They serve as a development tool for operation professionals, since they use similar conditions to those in the control rooms of the Operation Centers, with all of its infrastructure resources in order to give more realism to the simulated process.

In 2009, new enhancements were introduced, such as customization of the simulator screens for agents, allowing a better ambiance of the operators with the simulator. For the first time, a restoration training involving both the southern and southeastern areas was carried out, besides another drill with the North, Midwest and Northeast areas. Furthermore, four other regional drills were held in 2009.

In the Pre-Operation area, the reformulation of the Daily Operation Program Report and its availability on ONS site, aimed at facilitating the consultation of its users, which was based on opportunities for improvement identified in users satisfaction surveys, made in 2006 and 2008, should be emphasized.

Amongst the enhancements in the processes and systems to support the evaluation, storage and dissemination of operational data, the consolidation of post-operation procedures regarding ANEEL resolutions no. 310/2008 and 270/2007 should be highlighted.

2.3 – The Disturbance on November 10th, 2009

Description of the Disturbance

The blackout which occurred on November 10th, at 10:13 PM, under adverse meteorological conditions, was caused by atmospheric discharges and/or the reduction of effectiveness of isolators submitted to these severe conditions and was an unusual event, with very low probability to occur.

Itaipu powerplant, located in Parana, has an installed capacity of 14,000 MW and is responsible for about 20% of the energy consumed in Brazil and 87% of the energy consumed in Paraguay. The transmission system, which is owned by Furnas Centrais Eletricas, is formed by five lines, each about 900 kilometers long. Two of which run in DC, from Foz do Iguacu to Ibiuna, in Sao Paulo; the other three lines, in alternate current of 765 kV, extend to Tijuco Preto (SP). Particularly in the case of Itaipu, the 765 kV system was operating according to an even more rigorous safety criterion, above the standard usually adopted (simple contingency), foreseeing the possibility of losing up to two lines, i.e., in N-2 (double contingency).

According to oscillographic data, a short circuit was registered, at 10:13 PM, in the stretch between Ivaipora (PR) and Itabera (SP), close to this substation. The short circuit has reached the three transmission lines of 765 kV of Itaipu transmission system in about 10 hundredths of a second, verified since the incident occurred on the first line until the complete elimination of the event, in the third. The contingency was totally atypical, with three nearly simultaneous single phased short circuits, which progressed to three-phased short circuits due to the proximity to the substation.

The Special Protection Systems deployed by ONS acted correctly and immediately. The three transmission lines were turned off automatically to prevent damage to equipment. The opening of the three circuits interrupted the amount of energy supplied to the Southeast region and triggered a condition of oscillation amongst the several areas of the BIPS, which, consequently, caused the cascading opening of dozens of transmission circuits, disrupting power supply in different regions. For a better understanding of the severity of the impact, it is noteworthy that, between the opening of the three 765 kV lines and the collapse in the states of Sao Paulo, Rio de Janeiro, Espirito Santo and Mato Grosso do Sul, the process took less than five seconds.

Consequences of the Disturbance and System Restoration

The blackout of November 10th hit the regions in different ways and it was more significant in the Southeast/Midwest, where there was an interruption of 23, 335 MW (62% of the area's load). The islanding schemes functioned satisfactorily and prevented the spread of the problem, reducing the impact of the disturbances in the South, North and Northeast. The South, Northeast and North were little affected by the blackout, with 1%, 8% and 7% of its load interrupted, respectively, the latter two by the performance of the Regional Load Relief Scheme (ERAC). In the BIPS, the total interrupted load was 24,436 MW, or 40% of the total.

From a diagnosis of the situation, the process of restoration began immediately and was gradually and coordinately developed, as indicated in ONS Grid Procedures. The power failure had an average duration of 222 minutes in Espirito Santo, Mato Grosso do Sul, Rio de Janeiro and Sao Paulo. Other 14 states had interruptions of less than 40 minutes: Minas Gerais, Mato Grosso, Goias, Rio Grande do Sul, Santa Catarina,

Parana, Acre, Rondonia, Bahia, Sergipe, Paraiba, Alagoas, Pernambuco and Rio Grande do Norte.

Analysis of the Disturbance and Proposed Measures

The detailed study of the event is consolidated in the Disturbance Analysis Report - RAP, which was referred to the CMSE and ANEEL on December 17th, 2009. The RAP presents a list of 53 actions with deadlines and responsibilities that are consistent with the three fundamental goals pursued by ONS: the first is to work proactively, improving, whenever possible and feasible, the safety of the system, the second is, once the problem occurred, to minimize the domino effect, and the third is to reduce the restoration time.

Various actions proposed in the RAP are already being implemented, and some have been completed. Aiming at preserving the reliability of the electric network, pending the completion of actions related to Itabera substation (installation of booster sheds and improved shielding), ONS, based on determination of CMSE, has increased the safety level in the 765 kV system, between Foz do Iguaçu and Tijuco Preto substations, deploying limits that support the loss of three circuits in this interconnection (operational criterion N-3), even if, to meet this guideline, the additional thermal generation dispatch becomes necessary.

Since the amount of thermal generation required is directly associated with the load behavior, these values are being defined by ONS in the daily programming, with the objective of meeting the safety requirements at the lowest cost.

Finally, aiming at improving the safety of the BIPS, below, some of the actions that will receive priority approach are highlighted:

- Re-evaluation, in a joint work with EPE, of the safety criteria currently used for the expansion planning and the operation, especially for strategic points of the transmission systems, as major load centers and relevant transmission interconnections.

- Elaboration of proposal of criteria for selecting a set of strategic installations of the BIPS, establishing additional procedures to those currently in place for access, operations planning, protection and control, real time operation and maintenance, as well as specific criteria in order to subsidize the fiscalization processes by ANEEL.

- Re-evaluation of the system restoration procedures and transmission corridors, analyzing the feasibility of using thermal power plants, nuclear plants Angra 1 and Angra 2, and other resources, as well as the installation of self-restoration devices in more plants.

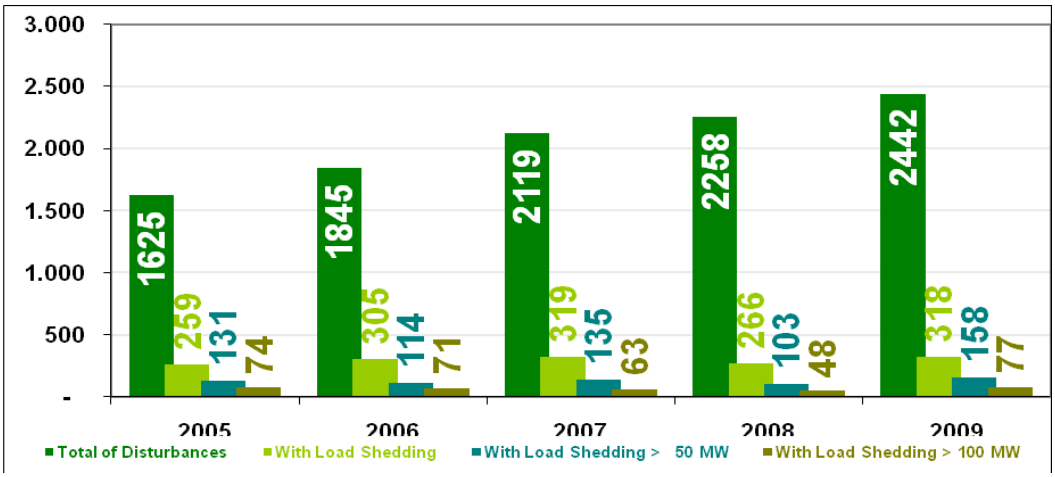
- Re-evaluation of existing schemes in the main transmission lines and generating plants of the BIPS and the continuity of the islanding process by sub-frequency in small and medium hydropower plants, with local load.

- Evaluation of the protection philosophy of transmission lines and equipment of the main trunks, which may affect the performance of the BIPS as a whole.

2.4 – BIPS Performance Indicators in 2009

From a total of 2,442 disturbances verified in 2009, in only 13.0% of them (318) load cuts were verified. However, it is worth noting that only 77 occurrences (3.2% of total) represented shutdowns exceeding 100 MW, which corresponds to the consumption of a city the size of Nova Iguacu, in Rio de Janeiro or Pelotas, in Rio Grande do Sul.

Evolution in the number of disturbances and their impact on the BIPS

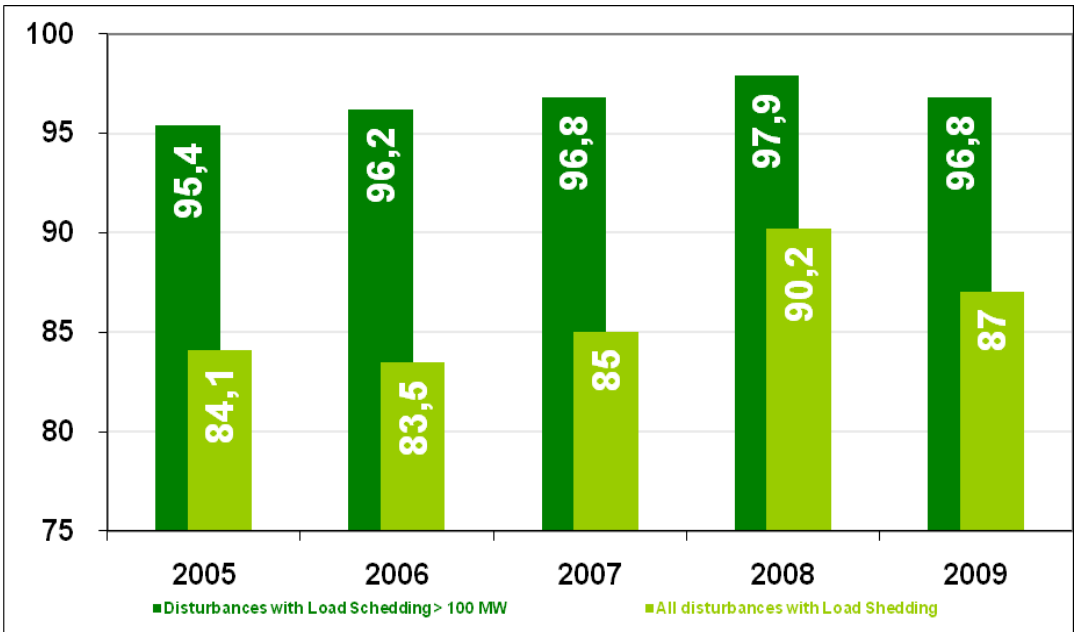


The values above refer to disturbances which involved the Primary Grid.

It is worth mentioning that, in accordance with CMSE specific regulations by Resolution 01/2005, ONS, in a joint work with the agents, implemented special operation measures, in order to guarantee the power supply during events of great social importance, especially in the days of Carnival, Christmas and New Year.

The safety in the electric supply achieved in 2009 may be translated by the performance indicators of the BIPS. The indicator of robustness is a good example of this result, because in 96.8% of the disturbances, the load cuts were recorded below 100 MW. These indicators have remained in the same levels of previous years, even considering the growth of the transmission grid.

BIPS Robustness Indicator



The values above refer to disturbances which involved the Primary Grid.

2.5 – Transmission Administration

Amongst the various actions taken by the operator in 2009 to ensure the quality and robustness of the transmission system of the BIPS in medium term, and also to improve its current performance, the following should be highlighted:

- The activities for the implementation of the transmission system of the Madeira River Generation Complex;
- The interconnection, to the BIPS, of isolated systems in the states of Acre and Rondonia and the continuity of studies for the interconnection of Tucurui-Manaus system;
- The operationalization of the tariff for using the system for generating plants connected in the voltage level of 138 and 88kV (TUSDg), in accordance with ANEEL Resolution 349/09;
- The adequacy of the processes and Grid Procedures to address ONS responsibilities in the treatment of Other Transmission Installations (DITs); and
- The systematization and issuance of documents for the technical capability of the plants participating in the 1st Reserve Power Auction for aeolic sources.

Regarding the transmission administration, ONS has undertaken several actions, in 2009, that allowed more efficiency and effectiveness to the processes of: access studies, proposition of expansions and reinforcements, contracts management and monthly assessment of services and charges. Below, a summary of the developed activities is presented.

2.5.1 – Expansions and reinforcements

In 2009, the Expansions and Reinforcements Plan, consolidated with the Transmission Expansion Plan - PAR / PET for the triennium 2010-2012, was issued.

The works displayed in this document indicate an increase of more than 20,000 km in the length of transmission lines, and about 25,000 MVA in the transformation capacity of the Main Transmission Grid in the reporting period, categorized in the following tables.

Voltage (kV)	Expansion Increase - km			Total
	2010	2011	2012	
230	4,045	4,476	387	8,908
345	253	106	186	545
440	14	22	30	66
500	1,160	3,666	1,355	6,181
± 600	---	---	4,750	4,750
Total	5,472	8,270	6,708,00	20,450

Voltage (kV)	Transformation Capacity Increase - MVA		Total
	2011	2012	
230	5,820	1,742	7,562
345	2,325	475	2,800
440	0	600	600
500	8,890	5,022	13,912
Total	17,035	7,839,00	24,874

It is estimated that the works included in the PAR 2010-2012 will require investments in the order of R$ 16 billion, considering the reference costs established by Eletrobras. Amongst the major works considered in this study, the following should be emphasized:

South Region

- *The State of Mato Grosso do Sul*
  - New 230 kV grid in the State of Mato Grosso do Sul for the interconnection of biomass plants and small hydroelectric plants.

Southeast and Midwest Regions

- *The State of Sao Paulo*
    - Definition of new supply points (Substations Cerquilho III, 230/138 kV, Nova Paraguaçu Paulista 138/88 kV and Assis 230/138 kV).
    - Transmission line Araraquara 2 – Taubate, in 500 kV, for the integration of the Madeira River Complex Plant.
- *The States of Rio de Janeiro and Espirito Santo*
    - Definition of new supply points (substations Viana 500/345 kV and Linhares 230/138 kV),
    - Transmission line Mesquita – Viana, in 500 kV.
    - Transmission line Mascarenhas – Linhares, in 230 kV.
    - Fifth 345/138 kV transformer of substation Jacarepagua and third 345/138 kV transformer of substation Viana
- *The State of Minas Gerais*
    - Definition of new supply points (substations Itabirito 500/345 kV and Padre Fialho 345/138 kV).
    - Transmission lines Mesquita – Viana, in 500 kV, and Pirapora 2 – Montes Claros 2, in 345 kV.
- *The State of Goias and Distrito Federal (Federal District)*
    - Definition of new supply points (substation Trindade 500/230 kV).
    - Transmission line Rio Verde Norte – Trindade, in double circuit of 500 kV.
    - Transmission lines in 230 kV: Trindade – Xavantes (in double circuit), Trindade – Carajas and Xavantes – Pirineus.
- *The State of Mato Grosso*
    - Transmission lines in 500 kV: Jauru – Cuiaba, Cuiaba – Rio Verde Norte (in double circuit) and Rio Verde Norte – Trindade.
    - Transmission lines in 230 kV: Nobres – Cuiaba and Nobres – Nova Mutum (in double circuit)

North and Northeast Regions

- Definition of new supply points (substations 230/138 kV: Carajas, Tucurui-Vila and Xinguara; substations 230/69 kV: Teresina III, Encruzo Novo and Arapiraca).
- Transmission lines in 230 kV: Jacaracanga – Cotegipe (double circuit), Sapeaçu – Santo Antonio de Jesus (third circuit), Teresina II – Teresina III

(double circuit), Miranda II – Encruzo Novo and Itacaiunas – Carajas (third circuit).

It is noticeable that, in 2009, the geo-referenced database of the transmission system - SINDAT was updated with information until the year 2011, being issued about 2,000 electro-geographic maps for use by companies in the electricity sector. It should be noted that the SINDAT website recorded 18,278 visits in 2009.

2.5.2 – Access to the Power Grid

In 2009, 106 Access Reports were issued, 70 of which for new developments and 36 regarding revisions. Considering the whole period from 1999 to 2009, the annual average value has been of 50 Access Reports issued.

It is noticeable that, in 2009, 318 access documents were developed to establish the technical requirements for the participation of new projects, representing 10.314 MW, in the 1st Reserve Energy Auction for aeolic sources, held in December.

2.5.3 - Compliance Analysis of Basic Projects with the Operational Requirements established in the Bidding Documents

ONS participation in the transmission system project of Madeira River shall comprise several steps, from the approval of compliance of basic projects of the installations to the operational requirements established in the bidding documents, until the stage of its entry into commercial operation, scheduled for April 2012 (bipole 1) and April 2013 (bipole 2).

The first step, in which the compliance of the basic projects of the installations with the requirements established in the bidding documents is being analyzed, started in 2009 and it has a fundamental importance to the project because all the conditions for the full and perfect performance of the system will be guaranteed. This step will also ensure the proper integration to the BIPS of the installations that comprise the various phases of the project.

During 2009, ONS was involved in various activities related to the integration of this new development, including:

- Compliance of basic projects of the installations to the operational requirements established in the bidding documents. ONS has started the analysis of this documentation, involving approximately 550 documents, including reports of studies, project designs, equipment characteristics, definition of protection systems, command and control system, supervision and telecommunications. Several system clarification meetings have been held with the participation of EPE, ANEEL, transmission companies and manufacturers involved.

- Integration of Santo Antonio and Jirau plants: The connection requirements of Santo Antonio and Jirau plants have been consolidated.

- Training of personnel and computer tools: in 2009, the first of three trainings in direct current transmission established in the transmission Bidding Documents was provided. This training was delivered by ABB to a team from ONS / EPE / ANEEL and had duration of 40 hours.

It is also important to mention the elaboration, in 2009, of technical requirements proposals to support the preparation of bidding documents for transmission installations regarding the Auctions 001/09 and 005/09, in a total of 20 lots, and the issuance of 21 Compliance Analysis Reports of basic projects.

2.5.4 – Transmission Contracts

In 2009, 125 transmission contracts and 270 additional terms were signed. Amongst the events that led to the conclusion of these instruments, the following should be included: the transmission auctions promoted by ANEEL in 2008; the integration of the Acre / Rondonia system to the BIPS, the annual re-contracting of energy by the distribution utilities; the revision of the permitted annual revenue of the transmission utilities; and the application of ANEEL Resolution No. 349/2009, which introduced the TUSDg.

2.5.5 – Monthly Settlement of Services and Charges

In 2009, the settlement of transmission services and charges involved 256 agents, with 66 transmission utilities and 190 grid users, and totalized an amount of R$10.550.0 million, with R$8.691 million related to the Main Transmission Grid (82%), R $ 1.242 million of the border grid (12%) and R $ 617 million related to sector charges (6%).

Also in 2009, the implementation of ANEEL Resolution No. 270/07, which aims at improving the quality of transmission services with the introduction of penalties due to equipment unavailability (PV), was consolidated. In July, the first cycle of PV evaluation was concluded. In order to do so, it was necessary the analysis of 6,087 events from July 2008 until June 2009, resulting in a reduction of revenue to the transmission utilities of 0.58%. The implementation of this criterion will surely bring relevant benefits to the BIPS, especially with regard to increasing the availability of its installations.

2.5.6 – Invoicing Measurement System

In 2009, the implementation of the Invoicing Measurement System – SMF continued, with the development of three meetings with the agents to monitor the implementation status, and the analysis of approximately 1,000 basic projects and 1,300 commissioning reports of measurement systems.

3 – 2009 MANAGEMENT RESULTS

3.1 – ONS Institutional Relationship

Intensifying the relationship and communication with its priority audiences was one of the main focuses of the Operator in 2009. With regard to external communication, ONS has participated in various sector technical events, highlighting issues related to the integrated operation of the BIPS, whether through speeches of its directors, presentation of papers by its technical personnel or the disclosure of its results in institutional stands.

The Operator has narrowed, in 2009, its relationship with the press, aiming at providing society with information about future power supply conditions or the main results of the operation of the BIPS. In particular, shortly after the blackout of November 10th, ONS took over its role as provider of reliable and updated information to the media, even still in the process of ascertainment of events.

The General Director of ONS was always available to provide information and give interviews, and participated in several forums and public hearings in the Senate and the Representatives Chamber.

The Communication area attended a lot of journalists from many different vehicles, besides contacts via telephone and email. These actions led to a large number of references to the Operator in the press. In the first three days after the blackout, 121 reports on the written press, 720 on the internet and 26 minutes of television programming about it were presented. In November, 337 reports on the written press were circulated with reference to ONS.

The Operator was subject, in 2009, to 7.8% of the news regarding the electricity sector in the written press. The favorable space in the media achieved the average of 86.8% in the year, less than the registered in the past three years (96.4% in 2008, 95.9% in 2007 and 98.5% in 2006). The index registered in 2009 was influenced by the questioning of the criteria for dispatching additional thermal generation for safety reasons; criticism to the idea of reducing the flow in Sobradinho in the Sao Francisco river, and questions concerning the blackout of November 10th.

ONS website received an average of 1,829 visits per day during the year, proving to be an important tool for dissemination of technical activities of the Operator and for its relationship with the Internet users. The Contact Us section of the site received, over the year, approximately 1,200 messages from visitors.

Regarding the institutional relationship, several technical meeting with associate agents and with the main sector associations were developed in 2009. Two meetings with agents and associations, on June 8th and October 7th must be remarked. The first, held at ONS Central Office and transmitted by videoconference to all locations at ONS, gathered 64 professionals, representing 36 agents and 10 associations.

In this meeting, the actions developed by ONS were comprehensively focused, in order to share its development with the agents. Among the topics discussed, the highlights were the rationalization of the budget, the search for more adequate and standardized facilities, the development of management indicators, and measures to preserve and acquire strategic knowledge to the organization. The major regulatory challenges and methodological issues related to the integration of new systems in the North to the BIPS were also emphasized.

At the meeting held on October 7th, with 51 participants representing 9 organizations and 28 agents, the objective was to identify, from the perspective of agents and associations, which are the main challenges of the Operator for the next five years, so they were considered in strategic planning on the term 2010-2014. Besides the technical and market-related issues, resulting from the increased complexity of the BIPS operation, some associations have emphasized the need for a more clear and objective communication between ONS and society.

A program for relationship with universities has its start, in 2009, with the realization of institutional lectures for students of the faculties of electrical engineering at PUC-Rio, UFF, CEFET and UFRJ. In the next years, this program should be expanded to other cities, and seeks other forms of engagement with universities to ensure the training of human resources appropriate to the needs of the Operator.

The celebration of ONS operating agreements with the Energy Research Company (EPE) signed on January 23rd, and with the Brazilian Water Agency (ANA), signed on October 21st should also be emphasized. In both cases, new guidelines regarding relationship and exchange of data and technical information between the organizations involved were established.

3.2 – ONS Strategic International Relationship

3.2.1 - Very Large Power Grid Operators - VLPGO

From the results of the 2008 meeting in Rio de Janeiro, throughout 2009, with ONS being responsible for the presidency of this group, all the efforts so the VLPGO could be legally instituted were developed, with adequate legal personality. Such objective was reached at a meeting held in October, in Washington, sponsored by MIDISO, with the approval of the "Bylaws of the Very Large Power Grid Operators Association".

This assured the full and stable functioning of the VLPGO, which became able to contract services, dividing the costs among participating members, besides introducing a policy of exchanging information and knowledge.

The works in 2009 were focused on preparing a specification on Phasor Measurement Units (PMU) and testing the units of potential suppliers. The issues and challenges associated with the integration of renewable sources, HVDC systems in operation and description of global best restoration practices were also identified.

It is important to note that the VLPGO is becoming also a place where leaders of the major operators in the world exchange experiences directly on the performance of their

systems and new technologies that have been used, including the share of consultancy costs in projects of common interest, as in the case of PMU studies.

3.2.2 - Regional Electric Integration Committee - CIER

The performance of ONS in the CIER was intensified mainly from its representation in the Project CIER 15 - Study of Energy Transactions between the Andean region, Central America and South America, with ONS serving as a host for the meetings of the work group held in 2009.

ONS has participated as a speaker in international seminars sponsored by the CIER, at which seized opportunities to develop closer relations with other representatives of operators in Latin America, as well as to integrate the work being developed in the scope of the VLPGO with those of the CIER.

It is also noticeable that, during the Meeting of the Central Committee of the CIER, held in November 2009, in Madrid, ONS General Director was conducted to the post of First Vice-President of the CIER for the period November 2009 - November 2011.

3.3 – Relationship with Agents and Integration of new installations to the BIPS

In 2009, the total number of Agents Associated with ONS reached 235 members (number 14.1% higher than the previous year, of 206 agents), which demonstrates the growing role of the Operator as a manager of the grid of institutions and installations involved in the operation of the BIPS and the increased complexity of the processes conducted in this activity.

A total of 481 Terms of Release (TL) for the Entry into Operation, for transmission installations, and 507 statements to meet the requirements of the Grid Procedures (DAPR) for generating facilities were issued that year.

Also in 2009, ANEEL authorized the permanent use of Module 24 – Installations Integration Process and Module 26 – Power Plant Operation Mode.

Throughout 2009, technical evaluations were carried out, with the support of specialized consultants, to support the evolution of the SIGA project, due to the need for further developments. The implementation of Portal SIGA will bring a new form of envisioning, organizing and executing the technical processes conducted by ONS and its associate agents.

3.4 – 2009-2012 Action Plan

The Action Plan establishes the actions necessary to achieve the strategic objectives of ONS through a portfolio of 49 projects, grouped in nine programs.

The projects developed in the scope of this Action Plan of ONS for the cycle 2009-2012 aimed at:

- Increasing the safety of the energy supply in the BIPS;
- Responding to the challenges resulting from the increased complexity of the BIPS operation, given the diversification of energy sources and its expansion;
- improving the action of ONS as the manager of the installations network and its performance in the Agents and Institutions in the power sector;
- Implementing the Knowledge Management and Technological Development;
- incorporating strategic vision to the management of Information Technology, seeking to extend its support to the organization's processes and the rational use of resources;
- Perfecting and consolidating the Management of Personnel;
- Promoting organizational development with a focus on the management of risks, costs and technical and corporate processes; and
- Strengthening the competence and institutional image of ONS.

Amongst the results achieved in 2009, the following should be emphasized:

- the start in the execution of the REGER Project – Electric System Management Grid;
- the continuity in the implementation of the terminal remote units of the SINOCON Project;
- the re-routing of the SIGA Project, with consultants to evaluate the results already achieved and proposing development of the portal into a more modern architecture;
- the evolution of methods, models, processes and tools for the BIPS planning and operation;
- the improvement of models and tools for the electric management of the network;
- the implementation of the ECSs – Safety Control Schemes;
- the investment of ONS in the management of personnel, systems and risks to the continuity of its activities.

3.5 – Management of Risks and Grid Procedures

Throughout 2009, ONS consolidated a number of initiatives for risk assessment of its technical and business processes.

Amongst these assessments, the risk assessment developed in the REGER Project (ONS Energy Management Grid) should be highlighted. This risk assessment was conducted based on a methodology created by ONS, based on practices of the PMI - Project Management Institute, for the management of risk of its projects. This initiative has involved approximately forty professionals of the company in the stages of identification and risk assessment, completed in December 2009, and in the definition and prioritization of actions aimed at mitigating the identified risks. This initiative will continue throughout the project development, with the step of monitoring risks and controls.

For the first time since they were created, the Grid Procedures had, in 2009, its approval on a final basis, through ANEEL Resolution No. 372/09 of 08/05/2009. To achieve this result, a broad review of these procedures was necessary, coordinated by the area of risk management and with effective participation of all technical areas of ONS, held in a joint work with ANEEL, motivated by the Public Hearings of the Agency, No. 049 / 2008 and No. 061/2009.

3.6 – Personnel Management

ONS human resources management is aligned with the corporate strategy and has, as its permanent challenge, to attract, develop and retain employees. This action is committed to the achievement of the mission and the scope of vision, in view of the national and global economic scenarios, the evolution of the power sector and the insufficient offer of skilled professionals in the market.

The Operator seeks to develop personnel and retain talents, implementing educational and health actions, besides offering compensation aligned to the complexity of the tasks, the performance of employees and the labor market.

In 2009, the staff was composed of 784 employees, including trainees and interns, temporary contracts, distributed amongst the locations in Brasilia, Recife, Florianopolis and Rio de Janeiro.

ONS has invested in the development of its employees, aiming at its sustainability, with emphasis to the actions developed in the three scopes indicated below:

TO ATTRACT:

- **Construir Program -** Held annually since 2001, this program recruits and selects graduated and technical-leveled trainees, who remain in the organization for up to two

years. Participants undergo a targeted training for the sector and work together with experienced professionals. During their stay in the program, they are evaluated and have the opportunity to participate in the internal selection process for junior positions.

- **Career Trajectories Project** - The project was conceived in 2009 to meet the demands of employees, identified by the climate research, the need for better viewing on the opportunities and criteria for careers in the organization. Thus, a group of managers from different areas, driven by HR and a hired consultancy, designed and detailed the project. Its main products are organizational skills, management and individual career trajectories, the access requirements and the framework of functional mobility. The expected benefits are the attraction of new professionals to ONS, the development of employees in a targeted fashion to the needs of the organization, contributing to its retention, through the increased visibility of career opportunities and professional development. The implementation of this project shall occur in 2010.

TO DEVELOP:

- **CAISE – Capacitation on Institutional Aspects of the Electricity Sector**: In 2009, the fifth class of the MBA in partnership with PUC-RIO was performed, focusing on the development of managers and senior professionals with the participation of 30 employees.

- **Knowledge Management (GC)**: The knowledge of primary focus are those considered strategic for the organization and at the same time, present aspects of criticality, such as concentration in few professionals, risk of imminent loss or productivity loss. In 2009, retention actions for the three selected knowledges of priority focus: protection and systemic control, Organon, and use of natural gas. The results regarding the knowledge on protection were: the expansion of the taxonomy of knowledge and the construction of maps containing the analysis of social networks, identifying the professionals who hold this knowledge at ONS and in the market. Regarding Organon, there were: case study and "storytelling" (practice of KM), to preserve the history on its development.

- **Identification of Potential** – The process of identifying potential appears as a tool to support management and decision making, and its results have contributed to the improvement of the individual development program (PDI), performance evaluation and feedback; internal recruitment; and career planning and succession. Implemented in November 2005, this process has already mapped 227 employees, representing 30% of the organization.

- **Management Development Program (PDG)** – With the participation of 110 managers, the following topics were focused this year: concepts and applications of the mapping of potential, coaching, productive dialogues and meritocracy.

- **PDI – Individual Development Program** – In 2009, 88% of employees participated in actions for their individual development, becoming more skilled in areas in which they operate and being able, in medium term, to assume other challenges in their careers.

- **Operators Development Program** – Workshops were held, addressing the following topics: Communication, Teamwork, Leadership, Negotiation and Personal Effectiveness. A total of 108 operators from Operation Centers in all locations were trained. This program was designed in partnership and to suit the demands of operators and managers in the Real Time Operation area, with significant results.

TO RETAIN:

- **GD – Performance Management** - The 2009 Cycle of Performance Management had its term extended to 12 months, establishing itself as a successful tool for managing teams and work processes at ONS. In this cycle, individual goals were considered for the Organizational Performance, contributing to the final result of the organization. Just as the experts and senior professionals, this year, the professionals and supervising operators also began to evaluate their direct managers in attitudes, taking the opportunity to register their feedback, according to the instructions given in the eleven Performance Management Workshops held.

- **Health Management** – The concern over the health of employees is gaining more space on the Operator. In 2009, ONS launched the Health Management Program, which includes all corporate actions aimed at balancing physical, mental and social health of its employees and family members. Its implementation shall include three pillars: Health Promotion, which includes the occupational health and medical care, Health Information Management, which involves the construction of a unified medical record, and Care Optimization, which will offer employees and their families a network of professionals selected for a better monitoring of their health, along with costs reduction.

- **Recognize** + - The Recognition Program was established in 2009 and included two categories: actions taken by the integrated work between different areas and teams and initiatives for knowledge management and technological development (GC / DT). Altogether, 91 actions were nominated by employees as candidates for awards, being 15 selected as finalists. In the end, two winners were chosen in each category, one by ONS Board of Directors and other by vote of the employees. The following actions were awarded: ONS Choir and Viver Bem Project, from Brasilia, in the category integration, and the Course of substations and high voltage equipment and the Course of Protection of Electrical Systems, in GC / DT.

3.7 – Telecommunication and Information Technology

ONS Information systems are strategic resources for the implementation of its technical and administrative processes. Based on this perception, the area of Information Technology and Telecommunications of ONS has sought alignment with the organization's strategic planning, inserting itself in finalistic processes and improving its capacity to manage resources and IT services to meet its internal clients and the agents.

In 2009, the area of Information Technology and Telecommunications sought a closer relationship with its internal clients and, together with the IT Director Committee, sought to align with corporate strategy, allowing its technology solutions, which cover the development of systems, the project management and the operation and support of production environments, to contribute effectively to the organization's results.

Amongst the results of the actions developed in 2009, the following should be highlighted:

- implementation of the additional functionality in the system of Monthly Settlement of Services and Charges – AMSE;
- implementation of the frequency and voltage indicators;
- implementation of the System of Investigation of Changes in the Operative Status of Generating Sets, Power Plants, Interconnections – SAMUG;
- implementation of the communication with the agents for reception and consistency of the Disturbance Integrated System (SIPER) data.
- advances in the control of cyber security, with the use of products for the automatic prevention / screening for unauthorized access trials and deployment of applications developed according to rules and procedures of digital security.

3.8 – Economic-Financial Management

ONS economic-financial management, in 2009, continued the process of improving the budget control, resulting in better utilization of financial resources from the charges for the use of the transmission system and the contribution of its members.

Fiscal Year Budget

ONS economic-financial Budget approved by ANEEL for the year 2009 was of R$ 342,564,00, being R$ 163.356,00 through ANEEL Resolution No. 1425/2008, complemented by ANEEL Resolution No. 1.634/08 for the first semester and R$ 179.208,00 through ANEEL Resolution 1.982/2009 for the second semester. The budget execution for the year was of R$ 334.928,00, representing 97.8% of the expected budget.

ONS Funds Sources

Under the terms of the article 34 of the Bylaws, amended by ANEEL Resolution no. 1.888, of April 22nd, 2009, the following are ONS funds sources:

I. Contributions from its associate members, proportional to the number of votes in General Assembly, included in Parcel “A” for purposes of tariff transfer and collected by other associate members and agents who are not subject to tariff transfer.

II. Funds resulting from the budget developed by ONS and approved by ANEEL:

a) Re-passed by members and agents of the electricity sector connected to the Main Transmission Grid, whose values are included in the Tariff for the Use of the Transmission System (TUST) and in the Parcel "A" of the Electric Energy Service Tariffs;

b) Collected by other associate members and agents of the electric sector who are not subject to tariff transfer;

c) Other revenues authorized by ANEEL.

For the viability of its budget, ONS used the resources from charges for the use of transmission and the contribution from associate members collected during the year 2009.

Financial Statements for the Year 2009

In compliance with the accounting practices required by Law 11.638/07, complemented by ANEEL Resolution no. 344/08, ONS continued the process of improvement of its accounting practices in the fiscal year of 2009.

Therefore, in compliance with provisions by ANEEL, as of January 1st, 2008, these resources began to be appropriated as anticipated revenue and amortized in the result in proportion to: (i) the development of the expenditure allocated in funding, (ii) the expenses allocated in fixed assets, (iii) charges for depreciation and amortization and (iv) the liquidation of financial liability, which comprises the funding and installments of taxes, so that any excesses or shortages of resources, when compared to expenses and related costs, are offset by reductions or increases in the following budget cycle.

Result of 2009 Fiscal Year

The current accounting practice adopted by ONS considers that the resources collected through the Charges for the Transmission System Use should be simultaneously recognized in return for the corresponding expenditures, and should not, therefore, present a surplus or deficit accounting, and should be recognized asset or liability balance for compensation. Thus, as a result of the adoption of this treatment, in 2009, the balance of R$ 15.859,00 was investigated, which, added to the balance of 2008, reaches the total value of R$ 30.704,00, recorded in current assets, which will be subject to compensation in the budget of the current or the following cycle.