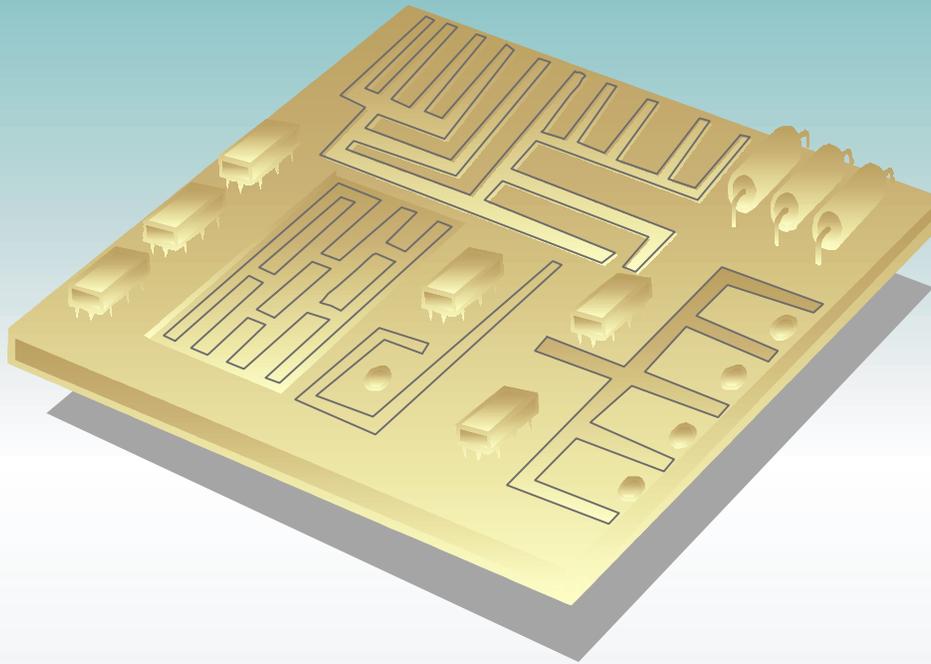


Advanced Control Systems Technology Transfer Initiative

Organization and Planning Meeting



VOLUME I

SUMMARY REPORT

October 20, 1999

**U.S. Department of Energy
Germantown, Auditorium**



Advanced Control Systems Technology Transfer Initiative Organization and Planning Meeting



SUMMARY REPORT

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**U. S. Department of Energy Auditorium
Germantown, MD**

Prepared by
Wolk Integrated Technical Services
under subcontract to Parsons Infrastructure and Technology
for the
U. S. Department of Energy
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Forward

The transfer of technology is a process by which existing knowledge, facilities, or capabilities developed by one or more entities are conveyed and utilized by others to fulfill actual or potential needs. The process is as old as technology itself and a natural result of human communication. However, formal recognition of its value did not occur in the United States until the "cold war" with the Soviet Union, with the establishment of the "Military/Industrial Complex," an effort aimed at garnering all of our resources towards the goal of winning that war. Technology transfer contributed significantly to the success of that partnership. Beginning in 1980, Congress has written legislation supporting government agencies that promote technology transfer, and directed appropriations for technology transfer projects. Today there are 20 public laws (dating back to the Freedom of Information Act in 1996) requiring government agencies to engage in technology transfer, and many departmental regulations are in place that promote cooperation between government and industry. Despite the significant achievements resulting from technology transfer, overall acceptance and implementation has been painfully slow.

At the U. S. Department of Energy, a strong corporate commitment, decentralized authority, staff encouragement, and the identification of mutual public/private interest benefits have created an effective atmosphere for technology transfer initiatives. This report is a result of the spirit of advocacy that exists at DOE and concerns a first of a kind technology transfer initiative in the area of modern and advanced instrumentation and controls. This initiative brought together for the first time leading industry and government experts to focus on creating more effective ways to transfer control systems technology, even though the Department does not have a technology development program in this area. The rationale underlying this effort was based on the recognition that problems with enormous public policy implications are not being adequately addressed, and are likely to become more severe with the changing structure of the energy industry-or, as Yogi Berra said, "The future ain't what it used to be."

Executive Summary

The objective of the meeting, cosponsored by U. S. Department of Energy (DOE), ISA (formerly Instrument Society of America), EPRI (formerly Electric Power Research Institute), EPA (Environmental Protection Agency), and NASEO (National Association of State Energy Officials), was to organize an effective Technology Transfer Initiative to accelerate the utilization of state-of-the-art advanced control systems in more U. S. industries and increase their efficiency and cost effectiveness. Approximately seventy people attended the meeting.

The needs of DOE in this area were outlined by Dr. Ernest J. Moniz, Under Secretary, Department of Energy, and Robert W. Gee, Assistant Secretary, Department of Energy. Ted McMeekin, formerly the President of Duke Engineering and Energy Services, presented the Keynote Address. Presentations were made to the audience describing advanced control systems that have been installed in power plants, buildings, motors, and industrial processes to reduce costs, reduce emissions, and replace outmoded and increasingly hard-to-service systems. After the presentations, a distinguished panel of experts, including Ted McMeekin, Mary Moreton of Bechtel Power, Joseph Naser of EPRI, Carmine Priore of Florida Power and Light, and Gordon McFarland of Honeywell and also representing ISA's POWID (Power Industry Division), articulated their views on what has been commercially implemented and what remains to be done. This was followed by vigorous interchanges between panel members and the audience.

A number of key points were made during the panel session and audience interaction with the panel that related to the utilization of advanced control systems. These include:

Technical Issues

- Users are in need of advanced instrumentation systems that are not available to them. Several users at the conference reported that their companies are driving the development of advanced instrumentation to meet their corporate needs because the vendors are not offering what they require.
- Nuclear Regulatory Commission (NRC) regulations and procedures have served as barriers to the conversion of nuclear plant instrumentation, from the analog systems that were originally installed when the plants were built, to more useful digital systems that are currently used in most industrial and fossil and hydro power plants.
- Advanced sensors that accurately measure and report key temperatures and flow rates can provide information that would result in higher efficiency and lower emissions for power plants. It is likely that many more of these sensors will have to be employed relative to the number used in most plants today to gather the required information.

Executive Summary

- Architect/Engineering/Construction firms see a need for smaller and more robust control and instrumentation products that can reduce installation costs.
- Advanced software is needed to manage and extract information.
- Anticipatory diagnostics are needed to reduce unplanned plant outages

Business Issues

- Today's competitive business situation requires that power systems and their component plants be operated at optimum performance levels.
- R&D spending has been reduced by the power and energy industries in response to uncertainties regarding deregulation and the resulting increased emphasis on short-term profits.
- Owners now require payback periods of less than 2-3 years to justify any non-regulated plant improvement investment.

Benefits

- Application of advanced controls will have the highest payoffs in the areas of improving efficiency, reducing emissions, increasing the number of megawatts that a generating unit can produce, and enhancing the ability to control the unit in response to instantaneous market demands.

Barriers to Implementation of Advanced Control Systems

- Owners of existing plants must respond to competitive market pressures and are limiting all new investments in those facilities.
- Suppliers find it difficult to invest in R&D for new technology because of uncertain market potential.
- Owners of non-regulated businesses are less likely to make long-term investments.
- Third parties that provide financing for many industrial and power projects have very low tolerance for the risks inherent in the early application of new technologies.
- Architect/engineering firms are often required to provide "lump sum, wrapped" bids in proposals for projects. This discourages innovation and risk taking.

Strategic Approaches to Overcoming Barriers

- Strategic partnerships between plant owners and vendors are needed to develop high-value products.
- Government funding of focused, long-term R&D is needed to promote technological diversity.
- Integrated government policies are needed on deregulation and emissions so that plant owners can reduce uncertainty and optimize planning.
- Collaboration is effective in leveraging limited R&D funds.
- On-line information exchange about problems and solutions is extremely valuable.

Recommendations

Breakout groups developed the following recommendations for follow-on activities that would enhance the effectiveness of the Technology Transfer Initiative. The audience endorsed the following actions:

- It was agreed that a Tech Transfer Initiative for Advanced Control Systems was needed. Based on the amount of useful information that was shared during this meeting, it was recommended that a second meeting be held in the near future to complete the organization of the Initiative. The preferred time and location for this meeting would be in conjunction with the ISA meeting that is scheduled for June 2000 in San Antonio, TX
- The content of the next meeting should be even more strongly focused on end user needs including current problems, applicable solutions, and particularly in today's competitive environment, the likely return on investments for the proposed solutions. Technical areas of interest include instruments and sensors, controls, knowledge-based products, and automation.
- Roadmapping activities at both DOE and EPRI have proven useful in developing successful R&D programs. One of the activities at the next meeting should be an informational presentation on the status of these Roadmaps in the area of instrumentation and control.
- A web-based system should be developed as the backbone of the Initiative to rapidly and cost effectively transfer information about advanced control systems. The first step will be to post the presentations made at this meeting on the NETL (National Energy Technology Laboratory in Pittsburgh, PA and Morgantown, WV) website. The second step will be to explore how an Advanced Control System website can be effectively and efficiently managed. It was suggested that ISA be asked if they would be willing to contract to manage the website.
- It is important that the website be easy to use, well organized, have search capabilities, have links to other sites, use key words, and have the ability to post messages about problems and solutions. It would be beneficial to catalogue both completed and ongoing control and instrumentation research projects on the website.
- It may be useful to pilot the website initially with a focus on DOE Fossil Energy activities that are tied in with NETL. If it proves successful, other DOE activities related to advanced instrumentation and controls funded for example by the Office of Renewables and Energy Efficiency and the Office of Nuclear Safety, among others, could be included.

- Other communication activities could involve the use of ISA publications to provide additional information about instrumentation and control systems. NASEO could have a potential role in the future by facilitating the funding instrumentation and control research at their in-state universities.

Agenda

7:30 a.m. Registration

8:00 a.m. Welcomes

Gordon McFarland, ISA-POWID

Dr. Ernest J. Moniz, Under Secretary, Department of Energy

Robert W. Gee, Esq., Assistant Secretary, Department of Energy

8:45 a.m. Keynote Address

Ted McMeekin, Retired President, Duke Engineering and Energy Services

9:05 a.m. Meeting Overview

Ron Wolk, Wolk Integrated Technical Services

9:15 a.m. Advanced Control Systems Exemplars

Paper # 1 – “An Intelligent Emissions Controller For Fuel Lean Gas Reburn In Coal - Fired Power Plants” by Jacques Reifman, Earl Feldman, and Thomas Wei of the Argonne National Laboratory and by Roger Glickert of Energy System Associates

Paper # 2 – “Use of An Intelligent Control System To Evaluate Multiparametric Effects On Iron Oxidation By Bacteria” by C.R. Tollie, D.J. Fife, J.A. Johnson, E.D. Larsen, K.S. Miller, and D.L. Stoner of Idaho National Engineering And Environmental Laboratory

10:15 a.m. Break

10:30 a.m. *Paper #3 – “Intelligent Sootblower Scheduling For Improved Boiler Operation” by Jeffery Williams, Xu Cheng, and Richard Kephart of Westinghouse Process Control and Viewgraphs*

Paper #4 – “Modern Technology For Instrumentation And Control Systems To Increase The Competitiveness Of Nuclear Power Plants” by Joseph Naser of EPRI

Paper #5 – “The Benefits of Steam Turbine Control System Upgrade” by Jerry Kopczynski of ABB Power Generation, Inc.

NOON Lunch (open seating), Poster Session, and Exhibits in the DOE Cafeteria

1:15 p.m. Panel Session

Topics

Summary of State-of-the-Art for Advanced Instrumentation and Control Applications

Future Advanced Control Product Needs

Future R&D Needed to Support Creation of Those Products

Reduction in Barriers to the Installation of Advanced Instrumentation on Control Devices

Discussion of the Next Steps to be Taken Regarding Advanced Instrumentation and Controls Technology Transfer Initiatives

Panelists:

Ted McMeekin, Retired President, Duke Engineering and Energy Services
Gordon McFarland, ISA-POWID

Joseph Nasar, EPRI

Mary Moreton, Principal Vice President and Manager of Engineering, Bechtel Power Corporation

3:00 p.m. Break

3:15 p.m. Organization of Next Steps and Proposed Steering Committee Working Groups:
Communication and Publications Committee
Meetings Committee
Awards Committee
Budget Committee
Paper/Poster Committee
Other Committees

4:00 p.m. Working Group Reports

4:30 p.m. Adjourn



Introductory remarks by Robert W. Gee, Esq. Assistant Secretary, Department of Energy

Welcome on behalf of the Office of Fossil Energy.

The purpose of this meeting is to plan effective technology transfer initiatives - ways to accelerate the deployment in the energy sector of modern and advanced control systems technology. There is abundant evidence that accelerating deployment will provide major opportunities to significantly reduce costs, increase efficiency, and reduce environmental impacts.

Control systems have roots that go back over two hundred years to James Watt. In 1788 Watt invented the governor - which was the first application of "closed-loop", or feedback, control to an industrial process. It was not until the 1940s, however, that control technology really emerged. By the 1950s there was great enthusiasm for using feedback control in industry and a new word, "automation" joined the English language.

Over the past twenty five years, modern controls have emerged and the technology has grown rapidly as a result of the challenges of the evermore stringent requirements posed by modern systems, such as flight vehicles, large space structures, unmanned air-ground vehicles, robots, chemical processes, and of course the availability of low-cost computing power. Advances in electronic technology during the last few decades have revolutionized control systems and should continue to drive the market for the foreseeable future. However, applications in the energy sector have not kept abreast of these developments. A major applications area of particular interest is the Nation's fleet of electric power plants, most of which were built more than 25 years ago.

For example, most U.S. nuclear power plants still operate with analog systems that were designed and installed in the 60's and 70's. Old systems have become unreliable, they lack necessary functionality, and are increasing operating costs because they are too costly to operate and maintain. A similar situation exists with fossil steam power plants. There are some still operating with original control systems that were installed 20 to 30 years ago. These obsolete systems contribute to loss of revenues through forced outages, and they are costly to maintain and repair. In these cases the solution is immediately obvious: the use of modern digital instrumentation and control (I&C) systems is needed to achieve the goals of improved availability and reliability, reduced O&M costs, and improved productivity.

The recent move to deregulation of the power industry seems to have delayed rather than accelerated investments, even though it is clear that technology will provide advantages in competitive markets. There is very little “market pull.” However, deregulation is creating an environment that demands state-of-the-art automatic controls because the economic consequences of controller performance are very high. Even today’s best technology might not be enough. In some applications, such as the control of large power systems, there may be a need for new paradigms to make it possible to provide predictions of increasingly volatile market demands. Therefore the challenges of evermore-stringent requirements can be expected to drive further advances.

We take for granted the profound contribution of control technology. Control systems impact every aspect of our lives and have the potential to continue to change the world in which we live. Some of the major issues concerning the world community are climate change, and pollution from sewage and industry effluents. Modern and advanced control systems provide the means to prevent the production of pollutants and to reduce the production of waste products. Obviously, there are enormous public benefits to be achieved through the solutions of these problems, therefore, governments have a major stake in this arena. In the United States, the Energy Department has the lead role on issues involving the energy industry. Our core competencies are in fossil, nuclear, and renewable energy. We have a long established tradition in Fossil Energy for advancing the state-of-the-art in the interest of public benefits.

For example, we have developed pollution-free fuel cells for distributed generation and combined heat and power applications that are now operating on natural gas. We are developing virtually pollution-free coal-fired power plants that will be demonstrated within the next fifteen years. Our programs have created advanced diagnostics and imaging systems for locating hard to find oil and gas. Today, because of our R&D it takes 22,000 fewer wells annually to develop the same amount of oil and gas reserves as it did in 1985. There are fewer dry holes, smaller drilling footprints, more productive wells and less waste. We have also contributed significantly in the controls area. For example, in 1994 we assembled the world’s leading authorities in adaptive control systems to facilitate the transfer of emerging technology from academia and laboratories to the energy sector. Many specific examples of our successful achievements are documented on our website. In short, we are champions for the adaptation of the best available technology in pursuit of reduced costs, increased efficiency, and reduced environmental impacts.

The infrastructure for control systems is well established. We don’t have the exact figures but we know that there are over 50 vendors and manufacturers. There are at least 175 control groups operating in 40 countries around the world. There are more than 17 professional societies and 26 journals devoted to controls systems. However, with the possible exception of Gordon McFarland’s ISA’s POWID group, we sense that there is not a good understanding in the controls community of the need to communicate with users in the energy industry. Hewlett-Packard coined the term MBWA – “Management by Wandering Around.” Wandering around

Panel Discussion Highlights

After the presentations, a distinguished panel of experts, including Ted McMeekin, who recently retired as President of Duke Engineering and Energy Services, Mary Moreton of Bechtel Power, Joseph Naser of EPRI, Carmine Priore of Florida Power and Light, and Gordon McFarland of Honeywell who also represented ISA POWID, articulated their views on what has been commercially implemented and what remains to be done. These individual remarks were followed by vigorous exchanges between panel members and the audience.

A number of key points were made during the panel session and the audience interaction with the panel, which relate to the utilization of advanced control systems. These are reported below in the categories of Technical Issues, Business Issues, Benefits, Barriers to Implementation of Advanced Control Systems, and Strategic Approaches to Overcoming Barriers. The key conclusions, which were presented in the Executive Summary, are summarized below along with some additional supporting comments derived from the discussions.

Technical Issues

- Users are in need of advanced instrumentation systems that are not available to them. Several users at the conference reported that their companies are driving the development of advanced instrumentation to meet their corporate needs because the vendors are not offering what they require.
- Advanced sensors that accurately measure and report key temperatures and flow rates can provide information that would result in higher efficiency and lower emissions for power plants. It is likely that many more of these sensors will have to be employed relative to the number used in most plants today to gather the required information.
- Architect/Engineering/Construction firms see a need for smaller and more robust control and instrumentation products that can reduce installation costs.
- Advanced software is needed to manage and extract information.
- Anticipatory diagnostics are needed to reduce unplanned plant outages.
- New control systems based on neural networks can efficiently process large amounts of data as a result of the rapid and continuing decline in the cost of computational power. However, a great deal of additional data is required to develop accurate and useful models. New instrumentation must be installed in plants to support the new approaches to plant control. In addition, diagnostics systems that can predict remaining component life and anticipate imminent failure can have a significant effect on plant profitability by preventing unplanned outages. The complexities and expense of installing digital equipment systems

are areas of concern to the firms that design, specify, and construct plants. The availability of information and control systems on the same platform would help accelerate the adoption of advanced systems by many companies.

- Nuclear Regulatory Commission (NRC) regulations and procedures have served as barriers to the conversion of nuclear plant instrumentation from the analog systems that were originally installed when the plants were built to more useful digital systems that are currently used in most industrial and fossil and hydro power plants.
- The analog instruments originally installed in nuclear plants are growing old. Replacement parts and technicians to maintain this aging equipment are both in short supply and in some cases unobtainable. Digital equipment, which should reduce costs in the long run and can provide additional information, has been proposed to replace the analog systems. In order to accomplish this, existing regulations and procedures will have to be modified. Several initiatives to accelerate the pace of the installation of this modern equipment are now under way. Most fossil plants have been retrofitted with digital controls over the last decade. There is little fundamental difference in the Balance-of-Plant components in nuclear and fossil power plants. Many of the systems developed for fossil plants have been successfully demonstrated in that application. Adoption in nuclear systems should not be technically challenging.

Business Issues

- Today's competitive business situation requires that power systems and their component plants be operated at optimum performance levels.
- R&D spending has been reduced by the power and energy industries in response to deregulation.
- Owners now require payback periods of less than 2-3 years to justify any non-regulated plant improvement investment.

Benefits

- Application of advanced controls will have the highest payoff in the areas of improving efficiency, reducing emissions, increasing the number of megawatts that a unit can produce, and enhancing the ability to control the unit in response to instantaneous market demands.

Barriers to Implementation of Advanced Control Systems

- Owners of existing plants must respond to competitive market pressures and are limiting all new investments in those facilities

Panel Discussion Highlights

- Suppliers find it difficult to invest in R&D for new technology because of uncertain market potential.
- Owners of non-regulated businesses are less likely to make long-term investments.
- Third parties that provide financing for many industrial and power projects have very low tolerance for the risks inherent in the early application of new technologies.
- Architect/engineering firms are often required to provide “lump sum, wrapped” bids in proposals for projects. This discourages innovation and risk taking.

Strategic Approaches to Overcoming Barriers

- Strategic partnerships between plant owners and vendors are needed to develop high-value needed products.
- Government funding of focused, long-term R&D is needed to promote technological diversity.
- Integrated government policies are needed on deregulation and emissions so that plant owners can reduce uncertainty and optimize planning.
- Collaboration is effective in leveraging limited R&D funds.
- On-line information exchange about problems and solutions is extremely valuable.
- Cooperation in funding demonstration projects by consortia with support from governmental agencies would help in reducing the risk of introducing conventional technologies into new applications and new technologies into conventional applications. The risk of either approach to implementing improved control technology has to be reduced in these competitive times where technological risk takers have reduced opportunities to obtain funds needed to finance application projects. Successful demonstration projects provide the confidence to validate the performance of new technologies.

Acknowledgements

The meeting, an Organization and Planning Meeting for Advanced Control Systems technology Transfer Initiative, was conceived by Dr. Sam Biondo and Goray Mookerjee at the U.S. Department of Energy. The goal was to involve any and all industries for an effective Advanced Control Systems Technology Transfer initiative that would accelerate the utilization of these devices and systems in the power generation industry. Goray Mookerjee recruited James Pearson, Executive Director of the Instrument Society of America (ISA) to co-sponsor the meeting, and Gordon McFarland, of Honeywell IAC was elected to participate as a representative of ISA's Power Industry Division (POWID). Mr. McFarland is currently the Director-Elect of ISA POWID. On June 11th, 1999, Goray Mookerjee, Dr. Sam Biondo, and Gordon McFarland met with James Pearson and his ISA staff at the ISA headquarters offices in Research Triangle Park, NC, to plan for the technology transfer initiative. Mr. Pearson's staff attending the June 11th meeting included John Bloomer, Debra Bloomfield, Jim Converse, and Dalton Wilson.

The meeting at ISA refined an initial agenda. It was determined that DOE's sponsorship included providing the meeting facilities, a DOE meeting facilitator, and arranging for sponsorship from the EPA, EPRI, NASEO and various offices within the DOE. Deborah Bloomfield volunteered to be the ISA meeting facilitator to handle the registration including coordination with Tina Michalski of the DOE in Germantown. Tina Michalski arranged for the cafeteria set up for the poster sessions and the tabletop presentations. Ron Wolk, a consultant, was named the DOE's meeting facilitator. Sandy Peters, Parsons Infrastructure and Technology, was asked to assemble all of the papers, poster presentations, and other meeting documentation into a handout packet for all the attendees. Gordon McFarland volunteered to contact industry vendors for papers, poster sessions, and tabletop presentations, as well as sponsorship of the coffee breaks during the meeting.

An invitation and call for papers flyer for the meeting was sent out by DOE to a mailing list from DOE files plus and ISA's mailing list for the Power Industry Division, Aerospace and Automation Division, Management Division, Process Management and Control Division, Environmental Division, and the Robotics and Expert Systems Division. From the flyer and from direct contacts with companies and individuals, five (5) papers, seven (7) poster presentations, and three (3) tabletops exhibits were selected by the meetings core team. Westinghouse Process Control, Siemens - Power Corp and Honeywell IAC each contributed to sponsor the coffee breaks during the meeting.

Goray Mookerjee arranged for the welcome speech by Robert W. Gee, Assistant Secretary Department of Energy, and for the keynote speaker, Ted McMeekin, former President and CEO of Duke Engineering & Services.

Acknowledgements

Ron Wolk facilitated a panel discussions on advanced controls for the power industry. Goray Mookerjee, Sam Biondo, and Ron Wolk invited the panelists. The panelist were; (1) Ted McMeekin, former President and CEO of Duke Engineering & Services, (2) Joseph Naser of EPRI, (3) Mary Moreton, Principal Vice President & Manger of Engineering of Bechtel Power Corp, (4) Carmine Priore, Manager I&C of Florida Power & Light Company, and (5) Gordon R. McFarland, Power & Energy Consultant of Honeywell IAC. Carmine Priore was invited to be a panelist during the morning of the meeting by Gordon McFarland and Ron Wolk.

The attendees included control system vendors, industry suppliers, utilities, government agencies, education institutions, and others. There were over 70 attendees at the meeting on October 20th. Each, subsequently, received a complete list of attendees.

The meeting began with remarks from Gordon McFarland who introduced the Under Secretary of Energy, Dr. Ernest J. Moniz. Dr. Moniz gave a very informative and exciting talk to the meeting attendees. His talk addressed the decline of research & development for controls technology in the industry for power generation. Dr. Moniz challenged the attendees to further pursue the initiative to transfer technology from other industries to the power generation industry and to push for R&D efforts, jointly by industry, utilities, educational institutions, and government agencies such as the DOE, to develop the technology for clean, efficient, and affordable energy. The second welcoming speaker was Assistant Secretary of Energy, Robert W. Gee who also challenged the attendees to enable the incorporation of state-of-the-art technology in the power generation industry, especially fossil and nuclear and renewable fuels. Mr. Gee challenged the attendees to “shape the load flow to follow the market demand on a real time basis”. Dr. Moniz and Robert Gee both left the audience with the knowledge that the DOE was ready to assist the power industry with the initiative of advanced control systems technology transfer for the generation of clean, efficient, and affordable energy

Ted McMeekin gave an excellent keynote speech on the power industry and what was needed for advancing the power industry. Mr. McMeekin also addressed the need for R&D in the power industry, citing the fact that between 1994 and 1998; R&D spending fell 40 percent. He identified five key factors for advancing the power industry; (1) the need for a sound energy policy, (2) a focused R&D program, (3) regulatory changes, (4) rapid commercialism of R&D efforts, and (5) the need for super applications for the power generation industry. Mr. McMeekin stressed that there is a wide gap between the operators of power generating plants and technology providers that needs to corrected for the success of our power industry in this country.

Ron Wolk provided an overview of the rest of the meeting and a view of the power industry as related to the meeting topic, advanced controls technology transfer. Mr. Wolk discussed the innovations in control technology, which were primarily driven by the reduction in the cost of computer capability. He also discussed the drivers to accelerate the introduction of advanced technology.

These drivers included:

- More vigorous competition in the power and other industries
- Aging control systems
- More stringent environmental regulations
- Upgrades that are now cost effective

The five papers, Advanced Control Exemplars, were then presented.

During the lunch break, there were seven (7) poster presentations and three (3) tabletop exhibits in the cafeteria area.

The tabletop exhibits were:

- (1) Total Plant Bottomline Results by Gordon R. McFarland, Honeywell IAC
- (2) OSI Software, Adam Tagui
- (3) Equipment and Controls, John Kowalcheck, Fisher Rosemont, Pittsburgh

In addition, there were several poster presentations that were not present due to scheduling conflicts with the presenters. These presentations were included in the handout package as the core team felt that the presentations were informative and added to the content of the meeting. These included:

- (1) Consortium for Electric Reliability Technology Solutions, Grid of the Future, White Paper on Review of Recent Reliability Issues and System Events by John F. Hauer and Jeff E. Dagle, Pacific Northwest National Laboratory, with Viewgraphs.
- (2) Issues Involved with Non-characterized Control of Methanotrophic Bacteria, by Daphne L. Stoner, Charles R. Tollie, Karl S. Noah, Dennis A. Davis, Karen S. Miller, and Dee Jay Fife, with Idaho National Engineering and Environmental Laboratory.
- (3) Information, Reliability, and Control in the New Power System, by J.F. Hauer, Pacific Northwest National Laboratory, and C.W. Taylor, Bonneville Power Administration.

After the lunch break and the poster presentations and tabletop exhibits, the meeting resumed with a panel discussion. Ron Wolk moderated the panel. Each panel member was given five (5) minutes to state their views on the morning session - both speakers and papers - and how the power industry could be enhanced by initiatives in advanced control systems technology transfer. Each panelist gave their views and then the audience was invited to question the panelist. The resulting questions and discussions were very informative and key to the topic of the meeting. The views and comments from the two utility panel members, Ted McMeekin of Duke Engineering Services and Carmine Priore of Florida Power & Light were especially

Acknowledgements

informative and appreciated by the audience. Mary Moreton of Bechtel gave excellent comments and replies from the view of an Architectural Engineering firm. Joe Naser of EPRI gave great comments and replies from the view of a utility member organization dealing in R&D projects. Gordon McFarland added to the panel with views from a controls and instrumentation vendor and as a representative of ISA POWID. The panel session was an important part of the meeting. Such sessions should be continued in future meetings of the type. The panel session drew in the audience participation and helped for all of the attendees to share views, concerns, ideas, and problems.

After the panel session, Ron Wolk facilitated a break out of the attendees to participate in a session to organize the next steps for the technology transfer initiative. Committees were organized to decide on (1) whether to hold another meeting, (2) what would be the contents of the next meeting, and (3) how would the attendees continue to share information and to organize the next meeting. The attendees were divided into three (3) groups. One group led by Ron Wolk to generate ideas on how to communicate within the group. Mark Perakis of EPRI led the group to decide on the content of the next meeting. Gordon McFarland of Honeywell and representing ISA POWID led the group to decide if another meeting should be organized. After everyone had time to discuss the issues within their groups, Ron Wolk asked each group leader to report their results.

The first group report was by Gordon McFarland, on whether there should be another meeting of this type. The group unanimously agreed that there should be another meeting and suggested that it may be advisable to have it as part of another industry meeting. It was suggested that the DOE sponsored Advanced Control Systems Technology Transfer Initiative might be a part of the ISA POWID Conference held each June. The POWID Conference usually has a half-day at the end that is dedicated to advanced controls papers. Gordon McFarland, current Director-Elect of POWID, was asked to suggest this at the next POWID Executive Board meeting, during the week of January 14th, 2000, in Vancouver BC.

Mark Perakis reported for the second group, on what the content of the next meeting should be. The ideas for the contents were;

- (1) To instill interest and encourage participation and to develop a theme with objectives that are of value to the industry
- (2) Solicit more end user involvement in presenting innovative technology applications:
 - Industry needs
 - Solutions of interest
 - Discuss how/what has been successfully applied
 - What has been the return on investment

- (3) Establish focus subcommittees to address industry needs;
 - Instrumentation and Sensors
 - Advanced process Controls
 - Knowledge Based Systems and Automation
- 4) Presentation on industry developments Roadmap from DOE for the 21st Century.
- 5) Suggested a round table discussion on forming a consortium for project development of industry, government, and academia.
- 6) Presentation of the catalog of communication media for related information, access and eligibility.

Ron Wolk reported for the third group, on how the meeting attendees and committees should communicate in the future. The group suggested that the web be used for communications. It was suggested that ISA be asked to set up and maintain the suggested website, possibly with DOE funding. The possibility of using the current DOE website was discussed. It was also suggested that a website or e-business might be able to be self-sufficient. There was agreement that whatever the website used, it must be easy to access, easy to search, and easy to learn to use. Every one agreed that the web is the way of the future and this meeting/event must use it.

After the three groups presented their suggestions and all related discussions were concluded, Ron Wolk called for adjournment of the meeting.

After the meeting, many attendees stated that they were glad they attended, that they felt the meeting was very useful, that it was a successful meeting for those in attendance, and that they were looking forward to the next meeting. Several attendees advised that they would be willing to help arrange the next meeting.

In conclusion, "An Organization and Planning Meeting for Advanced Control Systems Technology Transfer Initiative" was a successful beginning for a new, Department-wide DOE, ISA, EPRI, and NASEO initiative. The combined efforts by the core team, Goray Mookerjee and Dr. Sam Biondo of the DOE and Gordon McFarland of Honeywell representing ISA, by Deborah Bloomfield of ISA staff, by Ron Wolk the DOE facilitator, by Tina Michalski of the DOE, by Sandy Peters and Dr. William Owens of Parsons Infrastructure and Technology, were responsible for its success. Special acknowledgement is due to Frank Bishop and David Terry of NASEO, and to Drs. Bob Morley, Victor Der, and George Rudins at DOE, whose support was critical to the success of this initiative. Finally, we gratefully acknowledge the editorial assistance by Jorge Valladares and publication art and design by Frank Porcheddu.

8. Appendix: Attendance List

Ms. Christina E. Antonescu
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