

ASRL BACKGROUND INFORMATION

Background

Alberta Sulphur Research Ltd. was incorporated as a non-profit sulfur research organization limited by guarantee in 1964 to serve the growing Western Canadian Sulfur Industry. There were eight founding members followed by another eight in the succeeding decade. The Company has since expanded to sixty members from around the World.

Over the years, ASRL's research goals have varied somewhat depending upon the state of the recovered sulfur market but its commitment to serve members has been steadied by an effective industry-based Technical Advisory Committee. In the early years, emphasis was placed on the more global sulfur sphere by addressing pressing environmental problems through special project type investigations in addition to the traditional Core Research Program which might be described as from "downhole to end product".

Organizational Structure

The Board of Directors of Alberta Sulphur Research Ltd. effects policy through the organizational structure. This 9-member group is elected from member companies at the Annual General Meeting (usually held in June of each year). The Directors elect the ASRL President and Chairman of the Board of the Company and Treasurer/Chief Financial Officer. Additional corporate officers include the First and Second Vice-Presidents and the Corporate Secretary. In addition, there are a number of Board related committees:

The Executive Committee (President and both Vice-Presidents) respond to short term matters that are not addressed by the Planning Committee

The Planning Committee is chaired by the President and consists of members drawn from the Board of Directors. This committee is charged with formulating and maintaining a strategic plan as well as to examine membership structure and fee schedules.

The Nominations committee is struck to receive and/or solicit nominations and recommendations for positions on the board.

The Compensation Review Committee establishes guidelines for research staff salaries and benefits that maintain equitable and retentive compensation levels for a non-profit Company.

The Technical Advisory Committee

This committee consists of members drawn from the ASRL membership. Its objective is to assist Senior Management in defining research priorities on behalf of the members. As input from out-of-town members is critical to meeting the research needs of all members, and annual TAC extended input meeting has been established on the afternoon prior to the January Chalk Talks.

Research Activities

A great deal of our core research work is oriented towards increasing energy efficiency in industrial operations which, almost as a matter course, assists our member companies in meeting their environmental objectives. Key initiatives at present include sulfur management issues (acid gas injection, SO₂ injection and sulfur blocking), increasing sulfur recovery efficiency in Claus systems, utilizing sulfur in the petrochemical industries and handling sulfur in the transportation and export

chain. We also continue to do a great deal of work in the area of sour gas production, particularly with respect to sulfur deposition in well and surface facilities including methods for prevention of corrosion in pipelines.

ASRL has 17 research staff that comprise of all levels of education, from doctoral to technical qualifications. ASRL occasionally hosts visiting scientists and engineers, which assists the transfer of knowledge and technology internationally. The bridge between industry and academia is strengthened through the research and services that ASRL provides and the graduate students that conduct research within our facilities.

ASRL research is carried out in the modern research laboratories at the University Research Centre, University of Calgary. This allows the ASRL research team access to a wide range of University operated instrumentation and technological services.

The 2009 – 2010 Core Research Program will examine the following topics:

- 1 Improved Tail Gas Treatment Processes
- 2 Improved Liquid Sulfur Degassing Technologies
- 3 H₂S and SO₂ Solubility in Liquid Sulfur
- 4 Acid Gas Injection: Water Holding Capacity for Acid Gas Mixtures
- 5 Low Tonnage Sulfur Recovery
- 6 Measurement of Acid Gas Properties at High Pressure
- 7 Corrosion and Degradation of Concrete Liquid Sulfur Run Down Systems
- 8 Sulfur Dust Properties
- 9 Prediction of Sulfur Deposition in Sour Gas Reservoirs
- 10 Determination of the Kinetics of H₂S Oxidation in Compression Systems
- 11 Catalytic Tail Gas Incineration
- 12 Re-examination of Catalytic Partial Oxidation for Sulfur Recovery From Low H₂S Content, Hydrocarbon Contaminated Acid Gas
- 13 SO₂-Based Corrosion in Aqueous SO₂/S₈ Environments
- 14 Development and Regeneration of New Solvents and Measurement of Solvent Properties Under Sour Gas Pressure
- 15 Primary Upgrading of Oil Sands Bitumen

Fundamental Research Programs

These projects include ongoing research (Graduate student and PDF) which has partial external funding (University of Calgary and Natural Sciences Engineering Research Council of Canada):

- A. Production of C₃ – C₆ Olefins, High Octane Alkylate and Valuable Petrochemicals (ongoing, Ph.D. studies, Z. Premji)
- B. Computational Modeling of Catalytic Systems

Research Program Publication

Laboratory work for the following projects has been completed with publication in the ASRL Quarterly Bulletin as the only remaining task.

- A. Alleviation of Sulfur Deposition in Sour Gas Production Systems (in the Reservoir)
- B. Claus Converter Operation – Influence of Oxygen Ingress

Special Projects

Special projects are research efforts which aim to take ASRL core research work to the commercial demonstration phase. The first one listed below is “in progress” and the second one is in the “formulation stage”.

1. Injection of SO₂ into Disposal Reservoirs
2. Above Ground Sulfur Storage

We also conduct Contract Research for individual member companies on a confidential basis. By dictum of the Board of Directors of ASRL, this effort must not exceed 50% of total research work and should be conducted with members or prospective members only. There is a substantial discount to hourly contract research rates for member companies.

Since 1995 the senior technical staff of ASRL has delivered courses on the chemistry and technology of sour gas production, conversion to sulphur and sulphur management issues. These have been presented both here at the University of Calgary and abroad. Personnel from member companies register at reduced rates. Since 2005 ASRL has also hosted a Sulfur Deposition Symposium in May at the University Research Centre. This event includes a one-day course on upstream production chemistry and an industry forum where presentation are made concerning industry experience related to sulphur deposition and other aspects of sour gas production.

Apart from the more formal aspects of carrying out research, reporting our findings through a variety of conferences and workshops, and teaching, we are also available to assist members on a priority basis with periodic e-mail or telephone enquiries.

Communications

ASRL disseminates its research results to members through two semi-annual meetings held in Calgary at the end of January and June. These meetings are referred to as ASRL’s “Chalk Talks”. They give ASRL research staff the opportunity to share recent research results with members. Typically, 100-120 people attend these meetings, which offer our members a chance to network and learn about the latest research results from ASRL laboratories. At the January meeting, we host a Poster Session that gives member companies the opportunity to network and inform participants from other member companies of their technology. The June meeting is held in conjunction with our Annual General Meeting.

We distribute the formal results of our Core Research Program in the ASRL Quarterly Bulletin. This is published and made available in print to the membership four times a year. Articles are available in electronic format on request.

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