

## APPENDIX I

### OPERATING PROCEDURES Center for Multiphase Flow Research and Education Approved (November 1, 2019)

#### ARTICLE I - INTRODUCTION

- 1.1 The following operating procedures (“**Operating Procedures**”) will be used to govern the Center for Multiphase Flow Research and Education (“**CoMFRE**”).
- 1.2 The Operating Procedures are approved by the Director and the Industrial Advisory Board (“**IAB**”). The Operating Procedures can be amended at any time by an affirmative vote of the Director and two-thirds of the members of the IAB. These Operating Procedures are intended to be flexible and to change with the needs of CoMFRE.
- 1.3 CoMFRE is a center approved by the Iowa Board of Regents. Iowa State University is the lead university of CoMFRE. Additional universities may join CoMFRE as specified in Article XIII below (“**Affiliated Universities**”).
- 1.4 These Operating Procedures form a part of the Center for Multiphase Flow Research and Education Industrial Membership Agreement (“**Membership Agreement**”) with participating members. If there are any inconsistencies between the Operating Procedures and the Membership Agreement, the terms and conditions outlined in the Membership Agreement take precedence over the Operating Procedures, provided the terms in the Membership Agreement have been approved by the Director and two-thirds of the IAB.

#### ARTICLE II - DEFINITIONS

- 2.1 “**Affiliated University(ies)**” means universities collaborating in CoMFRE to conduct Shared Research.
- 2.2 “**University**” means Iowa State University.
- 2.3 “**Member(s)**” means any organization that signs a Membership Agreement and has paid the annual membership fee.
- 2.4 “**Industrial Advisory Board**” means a group composed of one representative from each Member, which provides input on (CoMFRE Operating Procedures and research direction.
- 2.5 “**Shared Research**” means projects funded using membership fees with results shared among the Members.
- 2.6 “**Mentor**” is an individual who oversees a Shared Research project. A Mentor may be a member of the IAB or employee of a Member.
- 2.7 “**Director**” means the ISU faculty member who oversees the administration of CoMFRE. The current Director is Dr. Theodore (Ted) J. Heindel.

#### ARTICLE III – PURPOSE

##### Vision Statement

- 3.1 CoMFRE will conduct industry-relevant fundamental research in multiphase flow science and its engineering applications in areas such as energy, healthcare, materials design, advanced manufacturing, sustainability, and infrastructure.
- 3.2 Other areas of research may be added as needs arise, as long as they are related to multiphase flows.

### Mission Statement

3.3 The mission of CoMFRE is to:

- Broaden the impact of multiphase flow research at ISU to a diverse set of societal challenges, such as sustainable production of energy, chemicals, and fuels; manufacture of advanced materials and pharmaceuticals; and development of novel devices and treatments for the benefit of human health.
- Conduct critical, unique, and high-impact research in the area of multiphase flow that will lead to transformative changes in industrial practice by integrating the activities and expertise of individual researchers to accelerate knowledge transfer from fundamental scientific advances in multiphase flow to industrial applications.
- Become an intellectual leader in multiphase flows for industry and government to rely on for technical leadership and guidance on best practices, by effectively serving the needs of a variety of stakeholders including government, industry, faculty, postdoctoral researchers, research scientists, and students.

### **ARTICLE IV – MEMBERSHIP**

4.1 A company, corporation, non-governmental non-profit organization, commodity group, government organization, or other organization becomes a Member upon executing the Membership Agreement and paying the annual Membership Fee. With a signed Membership Agreement, the Member should identify one (1) person to represent the Member on the CoMFRE Industrial Advisory Board (IAB).

4.2 The CoMFRE Membership Fee will be used to support Non-Proprietary Shared Research.

- 4.2.1 The annual Membership Fee is:
- \$57,500 for companies with more than 500 employees
  - \$28,750 for companies with 100 – 500 employees
  - \$5,750 for companies with fewer than 100 employees
  - \$1,150 for non-governmental non-profit entities

4.2.2 To account for normal increases in costs associated with running the center (e.g., student wages, tuition), the Membership Fee will increase by 15% every five years (i.e., 2027, 2032 etc.).

4.2.3 Eighty (80) percent of a given Membership Fee will be used to support Non-Proprietary Shared Research identified by the respective Member. The results of this research are made available to all Members. The Member will also provide a primary contact who will help direct the desired research; this person may or may not be the Member IAB representative. A CoMFRE Member may decline that eighty percent of their Membership Fee be directed towards a specific research project, in which case this portion of the Membership Fee will go towards pooled research identified and directed by the CoMFRE Leadership Team.

4.2.4 The Non-Proprietary Shared Research projects shall be conducted by students (undergraduate and/or graduate), postdoctoral fellows, technical staff, and/or faculty affiliated with CoMFRE.

- 4.2.5. In consideration for the Membership Fee, a Member will receive one vote toward decisions concerning CoMFRE operations. A Member may elect to have two votes by paying a second Membership Fee. A maximum of two Membership Fees is allowed for a single Member.
- 4.3 From time to time, a new company, corporation, non-profit organization, commodity group, or government organization may request, or be invited, to join CoMFRE as a Member. This prospective Member may join CoMFRE upon signature of the Membership Agreement, and payment of the pro-rated annual Membership Fee.
- 4.4 New Members will have access to information on previously funded Shared Research.
- 4.5 Upon approval by the Director and two-thirds of the IAB, an in-kind contribution may be allowed in lieu of cash payment for the Membership Fee. A Member will provide a list of categorized items to be considered as its in-kind support for approval. The value of in-kind payments will be based on fair market value. The in-kind Membership Fee must be reviewed and approved on an annual basis. Members are only allowed to have one vote paid for by an in-kind Membership Fee.
- 4.6 All Members will sign the same Membership Agreement.

#### **ARTICLE V- ORGANIZATION**

- 5.1 Each Member will have one representative on the IAB. A Member may have one representative on the IAB for each paid Membership Fee with a maximum of two representatives per Member pursuant to Section 4.2.5.
- 5.2 All Members may participate in the strategic planning of CoMFRE. The IAB will assist the participating faculty in identifying pre-competitive, industry-related research projects; recommend research projects for future work; assist the Director in identifying new Members; review the research and educational accomplishments of ongoing activities; and recommend restructuring and/or redirecting of on-going activities.
- 5.3 The Director will be responsible for all CoMFRE activities and will report directly to the Dean of the Iowa State University College of Engineering, or their designate.
- 5.4 Project principal investigators will manage specific Shared Research projects funded through CoMFRE Membership Fees and will report directly to the Director for matters related to CoMFRE-funded activities and will provide an annual report to the Members; they will report to their respective university administrators for all other activities. Principal investigators will be identified in specific Shared Research proposals and reports.
- 5.5 The University will provide a reasonable level of administrative support for the operation of CoMFRE. Administrative staff will maintain the CoMFRE website. Confidential documents will be made accessible to IAB members and University administrators through a link to a secure site.

#### **ARTICLE VI- ADMINISTRATION**

- 6.1 The Director will work with the IAB on strategic plans for CoMFRE and on recruiting new Members.
- 6.2 The Director will submit an annual list of member-supported research projects to the IAB.

- 6.3 Currently, 80% of each membership fee will be used to fund projects chosen and funded directly by individual memberships. When membership numbers reach a critical mass, and upon recommendation and approval by the IAB, the funding model may change to allow funding of projects from a pool of membership fees.
- 6.4 The remaining 20% of each membership fee covers University indirect costs and CoMFRE-related programs.
- 6.5 The Director will work with the appropriate departments on recruiting new affiliated faculty and promote CoMFRE collaborations within the University.
- 6.6 Each CoMFRE affiliated faculty member is encouraged to submit multiphase flow projects through the center and encourage their students (undergraduate, graduate, and/or postdoctoral) to participate in CoMFRE-related student activities. The faculty affiliate is responsible for advising their student(s) on university, departmental, and CoMFRE policies.

## **ARTICLE VII- REPORTS AND INTERACTIONS**

- 7.1 The Director shall provide an annual report to the Members during the annual meeting in the form of a PowerPoint presentation. This report will be available in electronic form for download from the CoMFRE website after the annual meeting.
- 7.2 For each Non-Proprietary Shared Research project funded within CoMFRE, principal investigators shall provide a project description with technical objectives and milestones to the Member sponsoring the project at the beginning of the project.
- 7.3 Non-Proprietary Shared Research project principal investigators and Mentors shall stay updated on project progress via regular teleconference briefings or short written communications. The form and frequency of these updates for each Non-Proprietary Shared Research project shall be coordinated between the respective principal investigator and Mentor.
- 7.4 All administrative issues, concerns, or conflicts regarding the activities of Non-Proprietary Shared Research and reporting are the responsibilities of the Director.
- 7.5 All reports will be provided to Members as pdf files and shall be marked 'confidential'.
- 7.6 Final reports are due to the Director and sponsoring Member one (1) month after each Non-Proprietary Shared Research project ends. The reports should be cumulative and detail all of the results of the Non-Proprietary Shared Research.

## **ARTICLE VIII- MEETINGS**

- 8.1 The Director will establish the schedule of activities and meetings for CoMFRE, as well as the agenda for the annual research review meeting.
- 8.2 CoMFRE Affiliates and Members will meet once a year to review on-going CoMFRE activities. Meetings will be held at Iowa State University. Meetings between a Member sponsoring a Non-Proprietary Shared Research project and the CoMFRE Principle Investigator may be more frequent and are at the discretion of the involved parties.

- 8.3 A Member may send more than one representative to the annual meeting, but will only have one voting representative per paid Membership Fee.
- 8.4 A non-member guest (“Guest”) may attend the open portion of the annual meeting. The Guest will have no membership rights, such as voting or access to reports.
- 8.5 Meeting agendas will be provided to Members at least two (2) weeks in advance of each meeting. Minutes for all activities of the annual meeting will be taken by the ISU CoMFRE Program Coordinator and distributed to the Members promptly after each meeting. All documents will be supplied as pdf files and marked confidential.
- 8.6 CoMFRE member meetings are closed to the public. Attendance is limited to faculty, staff, postdoctoral fellows, and students affiliated with CoMFRE and Members. Subject to Article 8.4, prospective members and University affiliates may attend CoMFRE open meetings by invitation of the Director.

#### **ARTICLE IX- PUBLICITY**

- 10.1 A Member shall not use the name of the University in any publicity, advertising, or news release without the prior written approval of an authorized representative of the University. Likewise, the University may not use the name of a Member in any publicity, advertising or news release without the prior written approval of an authorized representative of the Member. Press releases will be coordinated between the Director and the University press office. Notwithstanding the forgoing, the parties may satisfy any reporting requirements of their respective organizations, and Members will be listed on the CoMFRE web site and may be mentioned in public communications regarding CoMFRE and its activities.
- 10.2 The Director may post descriptions of all Non-Proprietary Shared Research on the CoMFRE website. The descriptions shall not contain confidential or proprietary information.

#### **ARTICLE X- PUBLICATIONS**

- 11.1 Researchers engaged in Non-Proprietary Shared Research shall be permitted to disclose in a publication the methods and results of their research after a review by the sponsoring Member for proprietary materials as outlined in the Membership Agreement.
- 11.2 In accordance with the Membership Agreement and subject to limited restriction, the University reserves the right to publicly disclose information arising out of or resulting from Non-Proprietary Shared Research. Prior to publication, a proposed public disclosure will be sent to the primary contact of the sponsoring Member at least thirty (30) days prior to public disclosure. University publication rights remain as per the Membership Agreement.
- 11.3 Non-Proprietary Shared Research results that have been approved for public disclosure may be used in additional publications or forums without additional Member review.
- 11.4 The following statement acknowledging CoMFRE support should be used for any public disclosure of research based on or developed with CoMFRE support: “This material is based upon work supported by the member organizations of the Iowa State University Center for Multiphase Flow Research and Education, with specific support from [Member name].”

## **ARTICLE XI- BENEFITS**

- 12.1 All Members will have Intellectual Property Rights as outlined in the Membership Agreement.
- 12.2 All Members will have an opportunity to directly contribute to CoMFRE research and education by serving as industrial Mentors and/or thesis committee members as appropriate and consistent with the policies and procedures of the University/Affiliated Universities.
- 12.3 All Members will have an opportunity to propose specific research problems and focus areas for Non-Proprietary Shared Research, which is supported by 80% of the Member's membership fee.
- 12.4 Information transfer between the faculty/student research teams and Members will be promoted by: (1) direct involvement of the industrial Mentor on the research team; (2) submission of reports; (3) research presentations to Members; and (4) participation in annual meetings.
- 12.5 Each Member is encouraged to provide input on all CoMFRE matters and federally-funded research. Letter of support from Members will be solicited as-needed for federally-funded research projects.

## **ARTICLE XII- NEW AFFILIATED UNIVERSITIES**

- 13.1 In the event that other universities express an interest to participate in CoMFRE as an Affiliated University, they should review the CoMFRE research objectives and plans and obtain concurrence from the Director prior to submitting a letter of intent to join CoMFRE.
- 13.2 A university requesting to participate as an Affiliated University must (1) demonstrate its ability to perform synergistic research within the focused research areas of CoMFRE; (2) document its willingness to work within the structure, policies, and procedures of CoMFRE; and (3) submit letters of support from the Director. Upon concurrence by the Director, including the approval of a two-thirds majority of the IAB, the university will become an Affiliated University.
- 13.3 A new university requesting participation in CoMFRE is encouraged to actively recruit new Members.