IFPRI BRIEF TEMPLATE

Check One: ☐**Project** ☒**Review** ☐**Collaboration**
☐**Workshop** ☐**Other**

Descriptive Title	Instrumentation Review for dense phase particle systems
Working Title[1]	Review of Measurement Systems for Dense Phase Particle Processes
Technical Area[2]	Dry Systems
Date	6-21-2021
Short Description	A review paper on instrumentation and methods of measuring industrially relevant properties in dense phase systems. To list some properties of interest: level, pressure, temperature, flowrate, density, moisture. These systems suffer from limitations of equipment placement, reliability, and fouling that limit the accuracy and trust by operators in the readings.
Objectives	• Review new and existing instrumentation for measurement of temperature, pressure, level, moisture, flow rate, density, in line PSD, chemical composition, and porosity • Pros and cons of each measurement technology for each process parameter • If possible a best practice or rule of thumb for different situations such as dense beds, fluidized bed, dense phase transport, etc. (can be grouped based on dynamics) • Upcoming or new measurement methods and technologies that are not necessarily commercial yet
Scope	• All powders (inorganic, organic, cohesive, small or large particles) • Out of scope: lean phase transport or low volumetric fraction systems
Past Work	• In-Line Sensors for Real-Time Measurement and Analysis of Bulk Dry Powder (IFPRI Review mostly focused on flow sensor technology. There are some good technologies reviewed though)

[1] Title used in meeting agendas and file archives
[2] One or more from the following list: W = wet systems; D = dry systems; F = particle formation; SR = size reduction; M = modeling; SE = systems engineering

Recommended Contractors (2 or 3)		
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