

## Senior Design Project Description for FALL 2016

### Project Title: Mixroom Material Handling (RSC\_MIXRM)

Supporter: RSC Chemical Solutions

Supporter Technical Representative: ASSIGNED

Faculty Mentor: \_\_\_\_\_ ASSIGNED  TBD (check one)

Single Team  Dual Team \_\_\_\_\_ (check one)

Personnel (EN/ET): 1 E, \_\_\_\_\_ Cp, \_\_\_\_\_ Cv, 2 M, 2 SE

(Complete if the number of students required is known)

Expected person-hours: (250 per student)

#### Description of Project:

RSC Chemical Solutions fills and packages liquids and aerosol products of both oil and water base. The batching and blending prior to filling is undertaken in approximately 20 vessels of various sizes in three areas (rooms). The loading and sequencing of the blending is generally by manual operation and manual switching of valves, pumps and mixers. Further some formulae have additives manually dumped in the vessel. There exists the likelihood that substantial improvements to the productivity, ergonomics and material flow of the processes can be made.

#### Initial Project Requirements (e.g. weight, size, etc.):

Develop a baseline Product-vs-Quantity and Frequency for the various formulae and the material additive methods. Research and develop a priority list of the areas for improvement (by formula) with rough cut capital requirements needed to make the improvements. Appraisal of the different material transfer and material handling methods will need to be undertaken.

NOTE: The Mixrooms are a Hazardous Location. Equipment and installation inside the Mixrooms will need to NEC Class I, Division 1 Group D. Applicable codes will need to be applied to the handling of any flammable liquids outside of the Mixroom too.

#### Expected Deliverables/Results:

For the top 20% (therefore assumed to be 80% of all improvements) of the priority list develop a fairly detailed capital BoM (including installation) and justification. Provide 3D CAD layouts for executive presentation. Recommendations to change package size/type, or state of matter, that Raw Materials are received, processed or stocked in.

Any automated sequencing resultant of the recommendation will be by PLC, the PLC type to be specified by the industrial supporter.

#### List here any specific skills or knowledge needed or suggested (If none please state none):

None