

Meeting 5

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| Date | Tuesday, 09 February 2021 |
| Attendees | Dr Ali Yetisen (AY), Marie Jones (MJ), Mathusan Kandiah (MK), Zong Lee (ZL), Yuxin Liu (YL), Mustafa Nasar (MN), Helen Ogbobi (HO), Wei Ooi (WO), Andreas Richardson (AR), Stephen Tan (SN), Sathurthini Thurairatnam (ST), Mingchuan Zheng (MZ), Antonia Feilden (AF), Abdullah Ahmed (AA) |
| Apologies | |
| Chair | Zong Lee (ZL) |
| Secretary | Mustafa Nasar (MN) |

Minutes

| Item | Discussion |
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| 1 – Recap of interim report (teamwork) | <p>Teamworking</p> <p>ZL: Improvement in optimising time since week 1 → meetings were split so only necessary people need to attend; subgroups made effective</p> <p>ZL: Need to improve work allocation (too much pressure on YL regarding Aspen)</p> <p>MJ: People moved around teams close to the deadline due to the pressure → poor management</p> <p>ZL: Suggestion – reallocation after every two weeks</p> <p>SN: Work is very interdependent – need to convey requests to other teams; need to find an effective method</p> <p>AY: Rate your interim report 1-10</p> <p>ZL, HY, MK: 7 or 8</p> <p>AR: Useful substitute to daily check-ins → read other team's report section</p> <p>MK: Could implement AR's idea weekly (once a week)</p> <p>AY: For teamwork, look at Slack. Any ideas from AA and AY?</p> <p>AA: Make an Excel deliverables sheet which has deadlines → update it daily, overview other people's tasks, see where workload needs to be shared (X is working on 10 tasks whereas Y is working on 3)</p> <p>AY: Important to build your network and friendship during FYD</p> <p>AA: Take out an hour each week to talk and socialise</p> <p>AF: Do a personal check-in with each teammate (job apps, home responsibilities, other course deadlines, etc) → implement in daily check-ins</p> <p>AY: Book a meeting with Faith Marsh regarding team wellbeing</p> <p>Interim report feedback</p> <p>ZL: What can be changed from interim report? E.g., if we find a better reactor, can it be changed?</p> <p>AY: Yes</p> <p>AY: Feedback timeline – 2 weeks for me to review, 2 weeks for KH to review</p> <p>ZL: Request ed AY to provide feedback directly to us as soon as possible</p> <p>AY: Yes, in 2 weeks</p> |
| 2 – Final report | <p>General report & working style</p> <p>ZL: Tips for moving from interim to final report?</p> <p>AY: Even distribution across all sections of the report</p> |

AY: Develop a clear outline early and follow it (stay organised)
 AY: Who will be keeping track of the team and coordinating all the teams?
 MJ: Volunteers
 AY: Need constant communication between upstream and downstream teams (e.g. changes in reactor teams affects separation and finance)
 AR: Major change decisions need to be relayed immediately
 ZL: Need to draw the line as to when to stop changing things
 AF: Be open to change, but be rational as to how necessary it is
 AF: Have a quality checking procedure in place to keep checking your work (have your Aspen reviewed by others!)

3 – Progress update

Synthesis

MJ: Our process is quite novel (not commonly found in industry) → we had to handle each reaction individually and then find the best way to combine the process (e.g. use MCDM)
 MJ: Next step is to perform in-depth sensitivity analysis to make sure our findings are robust
 MJ: Next steps is also to investigate process intensification and heat exchange
 MJ: How to do a sensitivity analysis – what is interesting and relevant?
 AA: Determine all your key parameters – do a sensitivity on these
 AY: There are many parameters and errors (e.g. intra-/inter-experiment errors, instrument errors, etc) – find the key ones
 AY: If you are not analysing an error/parameter – justify why not
 AA: Is KH sharing information about sensitivity analyses, MCDM, other useful synthesis tools?
 MJ: Yes, it is posted on BB
 AA: Will go through links and let you know an ideal way to go ahead with sensitivity analysis – contact AA

Reactor

ZH: 4 reactors chosen → need to decide which one to focus on for the final report.
 ZH: Need to decide the exact parameters for the reactors in the final report – any tips?
 AA: Safety, scalability, industrial transition from batch to flow, what factors affect this transition [upscaling of existing employees, compatibility with existing equipment (translation potential of project)]
 AF: Nitration is very exothermic – look at heat exchange potential
 AF: Caution: A big pressure drop can affect your reactor
 AF: Determine compatibility with chemicals (acids) → understand the corrosivity of your reactor (varies with temperature)
 AY: Look at automation, look at industry principles
 ZL: Should we discuss novel technologies (e.g. automation) in our final report?
 ZL: Include it NOW – your final report should be novel
 ZL: Should we include a comparison of current technology vs. our new continuous technology?
 AY: Yes, include that to emphasise the importance of this new process

Separations

SN: Description of the current separation system
 SN: Next steps: do more detailed design of each unit
 SN: We are lacking novelty – our separation is standard

AY: It is not necessary to have novelty in each section
 AF: Have you looked into counter current LLE columns? There is increased in LLE vs. stationary processes
 SN: Yes, seen 1-2 reports
 MZ: Did not feel it was novel
 AF: Having a flow unit takes less space (cheaper)
 SN: Any other considerations?
 AA: Cost is a major factor – 40% of industrial costs are due to separation
 AF: Other factors: solvent dilution, recycle, waste, does your process release heat?

EHS

HO: How to achieve ALARP? Advice?
 AY: Prioritise the most important aspects (e.g. pressure, heat) in every single section and execute it → don't focus on minor aspects
 AY: Six section - six aspects in your first layer
 AY: Have an internal discussion amongst each team → each sub team reports their safety aspects to HO and HO will put a constraint on their suggestion (yes/no/limit is XX)
 AY: HO gives input to sub teams and they should reduce their risks
 AA: Fault tree, HAZOP analysis?
 AA: HAZOP – is it done with all stakeholders?
 HO: It would be done by myself and just process flow team
 AA: After HAZOP, have an internal meeting with every stakeholder (it is important to get everyone's input)
 AY: Everyone contributes and then HO does the final execution
 AR: Get everyone on board as it also comes in the exam

Business

MN: Progress has been good; team size will need to increase (2-4 people) as economics become larger
 MN: Tasks include cash flow statements, KPIs like NPV, etc
 AA: Ready a template for your cash flow statement, balance sheet, etc

4 - AOB

5 - Finishing Next meeting: 3 pm on 16/02/2021

Actions

| Description | Assignee | Due |
|--|----------|------------|
| <i>General</i> | | |
| -Find a method to convey requests between sub teams | All | 16/02/2021 |
| -Create outline for the final report and timeline | MJ | 16/02/2021 |
| -Track the final report outline | MJ | Ongoing |
| -Quality checking procedure (checking Aspen, Excel,etc) | All | Ongoing |
| -Decide sub team split for Weeks 5 and 6 | All | Done |
| -Review guidelines, briefings and past reports to plan upcoming work | All | 10/02/2021 |
| -Plan report structure (each team) | All | 16/02/2021 |
| <i>Synthesis</i> | | |
| -Contact AA about sensitivity analysis methods | MJ | 16/02/2021 |
| <i>Reactor</i> | | |
| -Decide on unit for detailed design | ZL,WO,AR | 16/02/2021 |

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| <i>Separation</i> | | |
| -Decide on unit for detailed design | MK,MZ,ST | 16/02/2021 |
| <i>Safety</i> | | |
| -Look into mechanical integrity | HO | 11/02/2021 |
| <i>Business</i> | | |
| -Create template for financial calculations | MN | 16/02/2021 |

Approval

Ali K. Yetisen
Dr Ali Yetisen
Facilitator

Zong Hao Lee
Zong Lee
Chair

Mustafa Nasar
Mustafa Nasar
Secretary

Signature: 

Email: mustafa.nasar17@imperial.ac.uk

Signature: 
Zong Hao Lee (Feb 9, 2021 17:45 GMT)

Email: zong.lee17@imperial.ac.uk

Signature: 

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Group 8 FYD Meeting 5: 2021-02-09_minutes

Final Audit Report

2021-02-09

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