Plan Overview

A Data Management Plan created using DMPonline

Title: Next generation CCS technology for combined cycle gas turbine system

Creator:FAYEZ OBAYLIK B ALRUWAILI

Affiliation: The University of Sheffield

Template: Postgraduate Research DMP (The University of Sheffield)

Project abstract:

The rise in greenhouse gas emissions poses a significant environmental threat, contributing to air pollution and climate change. Amine-based carbon capture has emerged as a potential method for decarbonizing natural gas power plants. However, the commercialization of this technique encounters challenges, primarily due to the substantial thermal energy requirements for CO2 capture. This energy demand draws from the power plant itself, leading to a notable decline in overall performance.

This research studies the impact of innovative modifications to amine-based carbon capture to minimize thermal energy consumption, including inter-heated stripper (IHS), rich solvent recycle (RSR), and lean vapor compression (LVC). The initial results in this report indicate that the IHS, IHS with RSR, and LVC configuration could achieve energy savings of up to 6.51 %, 8.33%, and 13.02%, respectively.

The future plan will be to investigate the IHS, RSR, and LVC configuration in depth. This will include examining the influence of several parameters on their performance, a wide range of lean loading, variations on stripper height, diameter, and pressure, the effect of power plant-employed exhaust gas recirculation (EGR) and selective exhaust gas recirculation (S-EGR), and scenarios involving partial load conditions of the power plant.

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End date: 29-05-2028

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Defining your data

- What digital data (and physical data if applicable) will you collect or create during the project?
- How will the data be collected or created, and over what time period?
- What formats will your digital data be in? (E.g. .docx, .txt, .jpeg)
- Approximately how much digital data (in GB, MB, etc) will be generated during the project?
- Are you using pre-existing datasets? Give details if possible, including conditions of use.

All my results were obtained using the Aspen Plus simulation software over a period of three years.
The results are presented in the form of tables, figures, and Word documents.
Approximately 4 GB of data will be generated.
The datasets used in my analysis are exclusively from the Aspen Plus software.

Looking after data during your research

- Where will you store digital data during the project to ensure it is secure and backed up regularly? (University research storage)
- How will you name and organise your data files? (An example filename can help to illustrate this)
- If you collect or create physical data, where will you store these securely?
- How will you make data easier to understand and use? (E.g. include file structure and methodology in a README file)
- Will you use extra security precautions for any of your digital or physical data? (E.g. for sensitive and/or personal data)

I store my results on both my computer and Google Drive.
The filename for my data is "PHD Thesis."
To ensure easy access, I organize my files with clear and descriptive names.

Storing data after your research

- Which parts of your data will be stored on a long-term basis after the end of the project?
- Where will the data be stored after the project? (E.g. University of Sheffield repository ORDA, or a subject-specific repository)
- How long will the data be stored for? (E.g. standard TUoS retention period of minimum 10 years after the project)

- Who will place the data in a repository or other long-term storage? (E.g. you, or your supervisor)
- If you plan to use long-term data storage other than a repository, who will be responsible for the data?

For the long term, I will store the final version of my PhD thesis.
The data will be stored on both my computer and Google Drive.
I plan to keep my PhD data for 30 years.
I will personally manage and maintain the storage of my results.

Sharing data after your research

- How will you make data available outside of the research group after the project? (E.g. openly available through a repository, or on request through your department)
- Will you make all of your data available, or are there reasons you can't do this? (E.g. personal data, commercial or legal restrictions, very large datasets)
- If there are reasons you can't share all of your data, how might you make as much of it available as possible? (E.g. anonymisation, participant consent, sharing analysed data only)
- How will you make your data as widely accessible as possible? (E.g. include a data availability statement in publications, ensure published data has a DOI)
- What licence will you apply to your data to say how it can be reused and shared? (E.g. one of the Creative Commons licences)

I will make my thesis open access for all researchers.
To ensure accessibility, I will deposit my thesis in the university library.
I will allow researchers to reuse my data without restrictions.

Putting your plan into practice

- Who is responsible for making sure your data management plan is followed? (E.g. you with the support of your supervisor)
- How often will your data management plan be reviewed and updated? (E.g. yearly and if the project changes)
- Are there any actions you need to take in order to put your data management plan into practice? (E.g. requesting University research storage via your supervisor.)

I take full responsibility for my data.
I will review my data management plan every six months.