



UNIVERSIDAD DE ZARAGOZA

## **ACOUSTIC MODELLING OF REGASIFICATION AND COMPRESSION FACILITIES BELONGING TO NATURAL GAS TRANSPORT NETWORKS**

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From its reception in regasification plants to its delivery to low-pressure pipeline, natural gas is subjected to multiple physical processes carried out by industrial equipment which can generate high noise levels. A detailed acoustic characterization of these equipments would facilitate the development of noise maps associated with these industrial activities, allowing a reliable acoustic and environmental impact study of new plants, fulfilling the requirements established by the European Directive 2002/49/CE.

Noise emissions from industrial equipment such as pumps, compressors, air coolers, turbines... depend on a large number of parameters associated with operating conditions, the main goal of the study is to analyze the most relevant acoustics sources. Moreover, a proper acoustics characterization and location of noise sources in the model would allow to predict the effectiveness of specific mitigation measures.

The first step in the acoustic modelling process will be the acoustic identification and characterization of the equipments. The sound power of the different sources will be calculated starting from sound pressure or intensity measurements according to ISO standards. In a second step the acoustic environment of the facilities will be characterized considering key aspects of sound propagation such as the presence of buildings or other objects, weather conditions and relief and type of terrain. In the third step the results of the modelling processes will be analyzed and validated using the commercial software CadnaA and the corresponding noise maps will be generated. If the legal noise levels are exceeded, different mitigations measures will be proposed in order to achieve legal noise levels in the perimeter of the plants.

In summary, the main goal of this Project is to provide guidelines and acoustic models which enable a reliable acoustic characterization of the main noise sources used in ENAGAS natural gas regasification plants and compression stations.