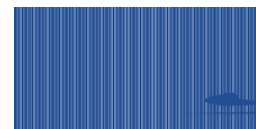


PROJECT FINAL REPORT

Grant Agreement number: 296658

Project acronym: NOCONDES

Project title: Novel Continuous Descent Simulation Test Support



Funding Scheme: Clean Sky CfP CS-RTD [SP1-JTI-CS-2011-01-SGO-03-11]

Period covered: from 15/07/2011 to 14/12/2012

Name of the scientific representative of the project's co-ordinator¹, Title and Organisation:
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Fax: +46 8 544 104 89

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Project website address: None

¹ Usually the contact person of the coordinator as specified in Art. 8.1. of the Grant Agreement.

Final Publishable Summary Report

This report's layout, structure, headings and required content form is based on the Clean Sky project final report template.

Executive Summary

The project has completed its objectives as set out in the Annex I of the Grant Agreement in terms carrying out Design Support, Test Shake Downs and Hosting Visiting Crews including supervision during the execution of the Human In The Loop (HITL) simulations as well as post simulations Observations, Analyses and Recommendations.

Support was given to NLR in the design of the Multi Parameter Guidance with Time and Energy Managed (MPG-TEMO) algorithm, the associated Human Machine Interface (HMI) and the simulator and the setup/validation design for the trials.

The project team completed the actions of giving Advice on Improvements of the MPG-TEMO Functions from Flight Operations Perspective; and Advice on Improvements of the HMI from Flight Operations Perspective.

The team also in close collaboration with NLR and Technical University of Delft (TUD) carried out the Development of Cockpit Procedures for Continuous Descent Operations with MPG-TEMO that were a prerequisite for the HITL simulations. NOCONDES also completed the Experimental Design Definition and Selection of Scenarios for the Simulator Experiment and the Development of a Pilot Briefing Guide.

The simulation sessions with external airline pilots were run successfully with NLR/TUD technical staff and operationally supervised by NOCONDES project pilots. In total nine subject (airline) pilots flew 108 successful simulation runs.

The subject pilots all accepted the MPG-TEMO concept and procedures and provided valuable feedback on the simulator, the procedures, the HMI's and concept at trial to the research and development team.

The NOCONDES partners analysed the simulation observations and pilot questionnaire responses deriving a general and subjective conclusion and recommendations for improvements on the MPG-TEMO function and project setup. The NOCONDES consortium analysis was made from a Flight Operations perspective in close co-operation with MPG-TEMO developers' team.

It was concluded that Time and Energy Management Managed Operations is the way to go and it has a large possibility of automation. It was also reflected that even with a great developed FMS algorithm, the quality of the input such as wind profile is crucial to time navigation.

Summary Description of Project Context and Objectives

The objectives of the project included:

- Provision of Senior Flight Crew (Test and Certification Pilots) for HMI prototyping sessions in Flight Simulators acting as Project Pilot.
- Development of Flight Procedures, definition and selection of scenarios for simulator experiments.
- Advice on improvements of Multi Parameter Guidance with Time and Energy Managed Operations from a Flight Operations perspective.
- Select and schedule flight crews for the simulator experiments including production of Pilot Briefing Guides.
- Providing Analyses from a Flight Operations perspective in collaboration with the Technical team.

Description of Main Scientific & Technological Results/Foregrounds

The significant results are the completion of the Deliverables as planned:

- D1 - Flight scenarios to validate MPG-TEMO in a simulator experiment (Based on the batch study results and mock-up demonstrations done by NLR/TUD)
- D2 – Pilot briefing guide to participate in the MPG-TEMO simulator experiment. (Including cockpit procedures)
- D3 - Flight Operations Analysis of the MPG-TEMO experiment. (A qualitative operational subjective assessment)

Potential Impact (including the socio-economic impact and the wider societal implications of the project so far) and the Main Dissemination Activities and Exploitation of Results.

The project contributes with a Socio Economic impact stemming from the realistic assessment and validation by representatives of the end user community contributions to the development of FMS functionalities, positively contributing to the European competitiveness in the R&D, operations and production of equipment for aircraft in the Air Transport System.

Cooperation and dissemination was limited from the beneficiaries to only be with the Topic Manager NLR who in turn were to decide how this Clean Sky project would be disseminated and further exploited in the work packages of the Clean Sky project were the work was part.

Address of the Project Public Website, if applicable as well as relevant contact details



Figure 1 APERO Simulator at NLR used for NOCONDES simulations

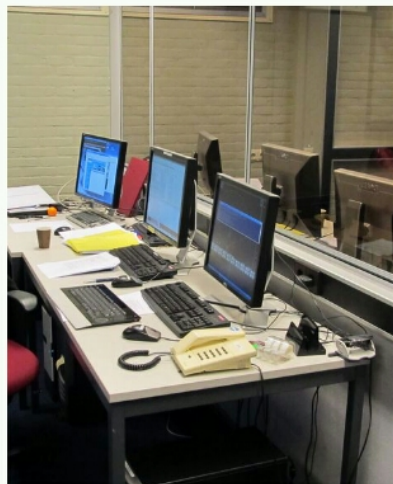


Figure 2 Simulation Sessions at NLR

The NOCONDES project consortium consisted of a strong team of airborne domain specialists including Test-, Certification- and Operational Line Pilots and Validation Engineers with a joint over 100 years of experience in the development of commercial aircraft:

AVTECH Sweden AB, (coordinator)
CertiFlyer B.V.
Use2Aces B.V.

<http://www.avtech.aero>
<http://www.certiflyer.eu>
<http://www.use2aces.com>



CERTIFLYER



Use and dissemination of foreground

Cooperation and dissemination was limited from the beneficiaries to only be with the Topic Manager NLR who in turn were to decide how this Clean Sky project would be disseminated and exploited.

Publicly available information from Clean Sky sources about the NOCONDES were republished on the beneficiaries' websites and newsletters. No specific co-operations with other projects/programmes were carried out.

Report on societal implications

Replies to the following questions will assist the Commission to obtain statistics and indicators on societal and socio-economic issues addressed by projects. The questions are arranged in a number of key themes. As well as producing certain statistics, the replies will also help identify those projects that have shown a real engagement with wider societal issues, and thereby identify interesting approaches to these issues and best practices. The replies for individual projects will not be made public.

A General Information *(completed automatically when Grant Agreement number is entered.*

Grant Agreement Number:

296658

Title of Project:

Novel Continuous Descent Simulation Test Support

Name and Title of Coordinator:

Anders Palm, Business Unit Director R&D

B Ethics

1. Did your project undergo an Ethics Review (and/or Screening)?

- If Yes: have you described the progress of compliance with the relevant Ethics Review/Screening Requirements in the frame of the periodic/final project reports?

0Yes x No

Special Reminder: the progress of compliance with the Ethics Review/Screening Requirements should be described in the Period/Final Project Reports under the Section 3.2.2 'Work Progress and Achievements'

2. Please indicate whether your project involved any of the following issues (tick box) :

YES

RESEARCH ON HUMANS

- Did the project involve children?
- Did the project involve patients?
- Did the project involve persons not able to give consent?
- Did the project involve adult healthy volunteers?
- Did the project involve Human genetic material?
- Did the project involve Human biological samples?
- Did the project involve Human data collection?

RESEARCH ON HUMAN EMBRYO/FOETUS

- Did the project involve Human Embryos?
- Did the project involve Human Foetal Tissue / Cells?
- Did the project involve Human Embryonic Stem Cells (hESCs)?
- Did the project on human Embryonic Stem Cells involve cells in culture?
- Did the project on human Embryonic Stem Cells involve the derivation of cells from Embryos?

PRIVACY

- Did the project involve processing of genetic information or personal data (eg. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)?
- Did the project involve tracking the location or observation of people?

RESEARCH ON ANIMALS

- Did the project involve research on animals?
- Were those animals transgenic small laboratory animals?
- Were those animals transgenic farm animals?

• Were those animals cloned farm animals?	
• Were those animals non-human primates?	
RESEARCH INVOLVING DEVELOPING COUNTRIES	
• Did the project involve the use of local resources (genetic, animal, plant etc)?	
• Was the project of benefit to local community (capacity building, access to healthcare, education etc)?	
DUAL USE	
• Research having direct military use	0 Yes x No
• Research having the potential for terrorist abuse	

C Workforce Statistics

3. Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).

Type of Position	Number of Women	Number of Men
Scientific Coordinator	0	1
Work package leaders	0	1
Experienced researchers (i.e. PhD holders)	1	0
PhD Students	0	0
Other	0	4

4. How many additional researchers (in companies and universities) were recruited specifically for this project?	1
---	----------

Of which, indicate the number of men:	0
---------------------------------------	---

D Gender Aspects

5. Did you carry out specific Gender Equality Actions under the project? ☐ Yes
☒ No

6. Which of the following actions did you carry out and how effective were they?

	Not at all effective	Very effective
<input type="checkbox"/> Design and implement an equal opportunity policy	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Set targets to achieve a gender balance in the workforce	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Organise conferences and workshops on gender	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Actions to improve work-life balance	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/>
<input type="radio"/> Other:		

7. Was there a gender dimension associated with the research content – i.e. wherever people were the focus of the research as, for example, consumers, users, patients or in trials, was the issue of gender considered and addressed?

☐ Yes- please specify

☒ No

E Synergies with Science Education

8. Did your project involve working with students and/or school pupils (e.g. open days, participation in science festivals and events, prizes/competitions or joint projects)?

☐ Yes- please specify

☒ No

9. Did the project generate any science education material (e.g. kits, websites, explanatory booklets, DVDs)?

☐ Yes- please specify

☒ No

F Interdisciplinarity

10. Which disciplines (see list below) are involved in your project?

☒ Main discipline²:

☐ Associated discipline²:

☐

Associated discipline²:

G Engaging with Civil society and policy makers

- 11a Did your project engage with societal actors beyond the research community? (if 'No', go to Question 14) ☐ Yes
☒ No

- 11b If yes, did you engage with citizens (citizens' panels / juries) or organised civil society (NGOs, patients' groups etc.)?

☐ No

☐ Yes- in determining what research should be performed

☐ Yes - in implementing the research

² Insert number from list below (Frascati Manual).

<input type="radio"/> Yes, in communicating /disseminating / using the results of the project					
11c In doing so, did your project involve actors whose role is mainly to organise the dialogue with citizens and organised civil society (e.g. professional mediator; communication company, science museums)?				<input type="radio"/> <input type="radio"/>	Yes No
12. Did you engage with government / public bodies or policy makers (including international organisations)					
<input checked="" type="radio"/> X No					
<input type="radio"/> Yes- in framing the research agenda					
<input type="radio"/> Yes - in implementing the research agenda					
<input type="radio"/> Yes, in communicating /disseminating / using the results of the project					
13a Will the project generate outputs (expertise or scientific advice) which could be used by policy makers?					
<input type="radio"/> X Yes – as a primary objective (please indicate areas below- multiple answers possible)					
<input type="radio"/> Yes – as a secondary objective (please indicate areas below - multiple answer possible)					
<input type="radio"/> No					
13b If Yes, in which fields?					
Agriculture Audiovisual and Media Budget Competition Consumers Culture Customs Development Economic and Monetary Affairs Education, Training, Youth Employment and Social Affairs		Energy Enlargement Enterprise Environment External Relations External Trade Fisheries and Maritime Affairs Food Safety Foreign and Security Policy Fraud Humanitarian aid		Human rights Information Society Institutional affairs Internal Market Justice, freedom and security Public Health Regional Policy Research and Innovation Space Taxation Transport X	

13c If Yes, at which level? <input type="radio"/> Local / regional levels <input type="radio"/> National level <input type="radio"/> European level <input checked="" type="radio"/> X International level										
H Use and dissemination										
14. How many Articles were published/accepted for publication in peer-reviewed journals?		0								
To how many of these is open access³ provided?										
How many of these are published in open access journals?										
How many of these are published in open repositories?										
To how many of these is open access not provided?										
Please check all applicable reasons for not providing open access:										
<input type="checkbox"/> publisher's licensing agreement would not permit publishing in a repository <input type="checkbox"/> no suitable repository available <input type="checkbox"/> no suitable open access journal available <input type="checkbox"/> no funds available to publish in an open access journal <input type="checkbox"/> lack of time and resources <input type="checkbox"/> lack of information on open access <input type="checkbox"/> other ⁴ :										
15. How many new patent applications ('priority filings') have been made? <i>("Technologically unique": multiple applications for the same invention in different jurisdictions should be counted as just one application of grant).</i>		0								
16. Indicate how many of the following Intellectual Property Rights were applied for (give number in each box).	Trademark	0								
	Registered design	0								
	Other	0								
17. How many spin-off companies were created / are planned as a direct result of the project?		0								
<i>Indicate the approximate number of additional jobs in these companies:</i>										
18. Please indicate whether your project has a potential impact on employment, in comparison with the situation before your project: <table border="0"> <tr> <td><input type="checkbox"/> Increase in employment, or</td> <td><input type="checkbox"/> In small & medium-sized enterprises</td> </tr> <tr> <td><input type="checkbox"/> Safeguard employment, or</td> <td><input type="checkbox"/> In large companies</td> </tr> <tr> <td><input type="checkbox"/> Decrease in employment,</td> <td><input checked="" type="checkbox"/> X None of the above / not relevant to the project</td> </tr> <tr> <td><input type="checkbox"/> X Difficult to estimate / not possible to quantify</td> <td></td> </tr> </table>			<input type="checkbox"/> Increase in employment, or	<input type="checkbox"/> In small & medium-sized enterprises	<input type="checkbox"/> Safeguard employment, or	<input type="checkbox"/> In large companies	<input type="checkbox"/> Decrease in employment,	<input checked="" type="checkbox"/> X None of the above / not relevant to the project	<input type="checkbox"/> X Difficult to estimate / not possible to quantify	
<input type="checkbox"/> Increase in employment, or	<input type="checkbox"/> In small & medium-sized enterprises									
<input type="checkbox"/> Safeguard employment, or	<input type="checkbox"/> In large companies									
<input type="checkbox"/> Decrease in employment,	<input checked="" type="checkbox"/> X None of the above / not relevant to the project									
<input type="checkbox"/> X Difficult to estimate / not possible to quantify										
19. For your project partnership please estimate the employment effect resulting directly from your participation in Full Time Equivalent (FTE = one person working fulltime for a year) jobs:		<i>Indicate figure:</i>								

³ Open Access is defined as free of charge access for anyone via Internet.

⁴ For instance: classification for security project.

Difficult to estimate / not possible to quantify	<input type="checkbox"/> x												
I Media and Communication to the general public													
20. As part of the project, were any of the beneficiaries professionals in communication or media relations? <input type="radio"/> Yes <input type="radio"/> X No													
21. As part of the project, have any beneficiaries received professional media / communication training / advice to improve communication with the general public? <input type="radio"/> Yes <input type="radio"/> X No													
22 Which of the following have been used to communicate information about your project to the general public, or have resulted from your project? <table border="1"> <tr> <td><input checked="" type="checkbox"/> X Press Release</td> <td><input type="checkbox"/> Coverage in specialist press</td> </tr> <tr> <td><input type="checkbox"/> Media briefing</td> <td><input type="checkbox"/> Coverage in general (non-specialist) press</td> </tr> <tr> <td><input type="checkbox"/> TV coverage / report</td> <td><input type="checkbox"/> Coverage in national press</td> </tr> <tr> <td><input type="checkbox"/> Radio coverage / report</td> <td><input type="checkbox"/> Coverage in international press</td> </tr> <tr> <td><input type="checkbox"/> Brochures /posters / flyers</td> <td><input checked="" type="checkbox"/> X Website for the general public / internet</td> </tr> <tr> <td><input type="checkbox"/> DVD /Film /Multimedia</td> <td><input type="checkbox"/> Event targeting general public (festival, conference, exhibition, science café)</td> </tr> </table>		<input checked="" type="checkbox"/> X Press Release	<input type="checkbox"/> Coverage in specialist press	<input type="checkbox"/> Media briefing	<input type="checkbox"/> Coverage in general (non-specialist) press	<input type="checkbox"/> TV coverage / report	<input type="checkbox"/> Coverage in national press	<input type="checkbox"/> Radio coverage / report	<input type="checkbox"/> Coverage in international press	<input type="checkbox"/> Brochures /posters / flyers	<input checked="" type="checkbox"/> X Website for the general public / internet	<input type="checkbox"/> DVD /Film /Multimedia	<input type="checkbox"/> Event targeting general public (festival, conference, exhibition, science café)
<input checked="" type="checkbox"/> X Press Release	<input type="checkbox"/> Coverage in specialist press												
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<input type="checkbox"/> TV coverage / report	<input type="checkbox"/> Coverage in national press												
<input type="checkbox"/> Radio coverage / report	<input type="checkbox"/> Coverage in international press												
<input type="checkbox"/> Brochures /posters / flyers	<input checked="" type="checkbox"/> X Website for the general public / internet												
<input type="checkbox"/> DVD /Film /Multimedia	<input type="checkbox"/> Event targeting general public (festival, conference, exhibition, science café)												
23 In which languages are the information products for the general public produced? <table border="1"> <tr> <td><input type="checkbox"/> Language of the coordinator</td> <td><input type="checkbox"/> English</td> </tr> <tr> <td><input type="checkbox"/> Other language(s)</td> <td>x</td> </tr> </table>		<input type="checkbox"/> Language of the coordinator	<input type="checkbox"/> English	<input type="checkbox"/> Other language(s)	x								
<input type="checkbox"/> Language of the coordinator	<input type="checkbox"/> English												
<input type="checkbox"/> Other language(s)	x												

Question F-10: Classification of Scientific Disciplines according to the Frascati Manual 2002 (Proposed Standard Practice for Surveys on Research and Experimental Development, OECD 2002):

FIELDS OF SCIENCE AND TECHNOLOGY

1. NATURAL SCIENCES

- 1.1 Mathematics and computer sciences [mathematics and other allied fields: computer sciences and other allied subjects (software development only; hardware development should be classified in the engineering fields)]
- 1.2 Physical sciences (astronomy and space sciences, physics and other allied subjects)
- 1.3 Chemical sciences (chemistry, other allied subjects)
- 1.4 Earth and related environmental sciences (geology, geophysics, mineralogy, physical geography and other geosciences, meteorology and other atmospheric sciences including climatic research, oceanography, vulcanology, palaeoecology, other allied sciences)
- 1.5 Biological sciences (biology, botany, bacteriology, microbiology, zoology, entomology, genetics, biochemistry, biophysics, other allied sciences, excluding clinical and veterinary sciences)

2. ENGINEERING AND TECHNOLOGY

- 2.1 Civil engineering (architecture engineering, building science and engineering, construction engineering, municipal and structural engineering and other allied subjects)
- 2.2 Electrical engineering, electronics [electrical engineering, electronics, communication engineering and systems, computer engineering (hardware only) and other allied subjects]

- 2.3. Other engineering sciences (such as chemical, aeronautical and space, mechanical, metallurgical and materials engineering, and their specialised subdivisions; forest products; applied sciences such as geodesy, industrial chemistry, etc.; the science and technology of food production; specialised technologies of interdisciplinary fields, e.g. systems analysis, metallurgy, mining, textile technology and other applied subjects)

3. MEDICAL SCIENCES

- 3.1 Basic medicine (anatomy, cytology, physiology, genetics, pharmacy, pharmacology, toxicology, immunology and immuno-haematology, clinical chemistry, clinical microbiology, pathology)
3.2 Clinical medicine (anaesthesiology, paediatrics, obstetrics and gynaecology, internal medicine, surgery, dentistry, neurology, psychiatry, radiology, therapeutics, otorhinolaryngology, ophthalmology)
3.3 Health sciences (public health services, social medicine, hygiene, nursing, epidemiology)

4. AGRICULTURAL SCIENCES

- 4.1 Agriculture, forestry, fisheries and allied sciences (agronomy, animal husbandry, fisheries, forestry, horticulture, other allied subjects)
4.2 Veterinary medicine

5. SOCIAL SCIENCES

- 5.1 Psychology
5.2 Economics
5.3 Educational sciences (education and training and other allied subjects)
5.4 Other social sciences [anthropology (social and cultural) and ethnology, demography, geography (human, economic and social), town and country planning, management, law, linguistics, political sciences, sociology, organisation and methods, miscellaneous social sciences and interdisciplinary, methodological and historical SIT activities relating to subjects in this group. Physical anthropology, physical geography and psychophysiology should normally be classified with the natural sciences].

6. HUMANITIES

- 6.1 History (history, prehistory and history, together with auxiliary historical disciplines such as archaeology, numismatics, palaeography, genealogy, etc.)
6.2 Languages and literature (ancient and modern)
6.3 Other humanities [philosophy (including the history of science and technology) arts, history of art, art criticism, painting, sculpture, musicology, dramatic art excluding artistic "research" of any kind, religion, theology, other fields and subjects pertaining to the humanities, methodological, historical and other SIT activities relating to the subjects in this group]