

- Brief Overview of the Clatter Radar Trials
 - The Report!
 - What we have gained from Trials
- DTI Sponsored Safety case
- Initial Report from DTI Sponsored Aviation Workshop
- Where are we & Ways Forward



- 1990s Small Scale trial in Cornwall
 - Showed “clutter” from Wind Turbines
 - Resulted in MOD 30nm + Line-of-sight interest
- 2004 Clee Hill Trial
 - Mobile Radar deployed to gather more evidence of effect of wind turbines in radar
 - Additional adverse effects displayed
 - MOD area of interest extended beyond 30 nm



- 2005 First Clatter Trial
 - Radar able to “see” 4 different wind farms
 - Industry demonstrate mitigation technologies
 - BAE with ADT and Sensis with SPE3000
 - Major opportunity to record live data
 - Live demonstration of the problems



- 2006 Clatter 2 Trail
 - Formally run trial by MoD Test & Evaluation team
 - Set flight profiles by calibrated aircraft
 - Against unmodified Watchman radar
 - Against Watchman with ADT
 - Against Watchman with SPE3000
 - Independent analysis of results



- Report produced by MoD Test & Evaluation Team
- Report restricted circulation due to Commercial issues.
- Bottom Line *from my perspective*
 - Both products showed potential but were not yet able to fully mitigate the effects of wind turbines



- Enabled industry to demonstrate their products
- Amassed large amounts of data
- Demonstrated difficulty of the technical challenge
- Catalyst to pull interested parties of the aviation and wind power industries together
- Demonstrated the extent of the problems to a wide audience
- Showed the willingness of the DTI, MoD and industry to engage



- The “Magic Box” solution
 - Wind farms disappear and aircraft returns unaffected!!!
 - Industry unable to provide such a black and white solution yet
- Other, complementary work streams
 - Safety Case Issues
 - Aviation workshop



- Provision of an ATS requires fusion of 2 skill sets
 - The Engineer
 - The ATC operators
- Core to everything is SAFETY
- Any new mitigation technology will require a Safety Case no matter how good it is



- 2006 HVR contracted to produce Generic Safety Case to complement Clatter 2 trail
 - Act as a template for any radar solution
- Safety Case worked up with assistance from MoD, SRG and other aviation interests
 - Undergoing final review round
- Demonstrated complexity of ATS safety case
 - Provision of a Safety Case for ATC service not just for the engineering product



- Workshop to agree some baseline assumptions and to identify fruitful work packages
- Attended by aviation regulators, engineers and ATC` operators
- 2 day “Quick and Dirty” to keep momentum going forward



- Report Due by end of May
- Very briefly – Topics included
- ATC Procedures
 - Increased pressure on Class F&G airspace
 - Choke points
 - Impact of more accurate avionics



- Safety Case Matrixes and Best Practice
 - Qualitative v Quantitative....
 - Radar Service based
 - Complexity of aviation service provision
- Safety Cases
- Mandatory Carriage of Transponders
 - Unlikely before 2012 (F&G airspace)
 - A major mitigation but not a total one



- Aviation Hazards Generated by Wind Farms
 - Hazards not understood by everyone
 - Need for a “Janet & John” guide
- Acceptable Radar Performance
 - Traditional methods may not be appropriate
 - New concepts to generate acceptable standards
 - 2 in 20 “straw man” proposal

(Personal View)

- Confident that Industry will continue to hone their products
- HVR safety case - solid start to further develop generic safety case
- Methods for assessing radar performance could be developed to assist our goals
- Workshop identified some key areas for development





- *Can Aviation & Wind Generation Interests Operate in Harmony?*
- I believe they can provided that:
 - Industry further refines their mitigation technologies
 - Robust Safety Case arguments are developed
 - All side respect each others interests
 - Funding and resources are available to drive forward outstanding issues