

# Identifying a Collaborative Work Unit in Approach Control

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**Abstract.** This poster proposes a collaborative work unit in the form of an air-ground team, as a means of studying the decisions of pilots and controllers during the approach phase of flight, in Air Traffic Management. We argue that the work of air traffic controllers and airborne crews on approach to an airport can be qualified by collaborative interactions. Such interactions are shaped by: a) the distributed availability of traffic and atmospheric information on approach, and b) individual skill-distribution due to the division of labour strategies in approach control.

## Introduction

During an approach flight phase, airborne crews and ground controllers face both strategic and tactical decisions relating to the planning and execution of a landing operation. It has been observed that certain crews persist in penetrating adverse weather despite the availability of information indicating that decisions to deviate or hold might be safer alternatives (Dismukes, Berman, & Loukopoulos, 2007). The models explaining such 'erroneous' decisions are grounded in studies of the psycho-physiological limitations of individuals.

We argue that the collaborative interactions of pilots and controllers during the approach phase of flight (air-ground teams) indicate a functional work unit. The functional operation can be considered to be an 'aircraft approach' and is determined by the goals of safety and efficiency. The structure and behaviour of the work unit is determined by two mutually related factors namely the distributed availability of traffic and atmospheric information shared by a distributed team of individuals with specialised skill sets.

## Methodology

Normal Accident Theory (Perrow, 1984; Sagan, 1993) considers incidents and accidents occurring in complex socio-technical organisations as a routine part of system operations. A normal occurrence could be qualified by routine operations which lead in certain situations, to an adverse outcome such as the cases of Controlled Flight into Terrain (CFIT), Thunderstorm Penetrations and

Deviations from Air Traffic Management Procedures (SRC, 2006). In fact, such situations are qualified as exceptional and non-routine, only in hindsight as they normally occur without any reported problems (Dekker, 2005, 2006; Woods, 2005). We performed detailed conversation analyses of five (5) air traffic control occurrence reports as a means of understanding the interactions of pilots and controllers. The investigation reports include transcribed verbal exchanges among pilots and controllers as well as post-accident data from the investigating agencies. The full methodology has been reported elsewhere (Joyekurun, Amaldi, & Wong, 2007).

## Results and Discussion

The results obtained indicate a complex re-distribution of work among the pilots and controllers as a means of dealing effectively with dynamic traffic profiles and atmospheric conditions within localised regions along the approach flight path (Joyekurun et al., 2007). Moreover, the decisions of crews to attempt un-safe operations can be understood within the scope of organisational pressures for added efficiency.

## Conclusion

Performing an approach is a complex goal which makes use of specialised operator skill sets and which requires mutual information exchanges. Such interactions and team decisions occur under organisational pressures. As a result operators often indulge in un-safe behaviours which might lead to incidents when added complexity arises in the form of adverse atmospheric conditions.

## References

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