We would like to thank the reviewers for their insightful comments and to address several questions:

Heuristic:

We use two inadmissible heuristics: one measuring relaxed plan length (h~FF) and the other measuring failed domain interpretations (h~M). h~FF is the primary heuristic because we are after scalable planning (relaxed plan length is highly correlated with the depth of a solution in the search graph), whereas using h~M as the primary heuristic leads to poorer scalability (it is not correlated with solution depth). h~FF indirectly incorporates knowledge about failures because we count models or PIs to bias action selection.

h~FF is not related to CA’s algorithm, which is based on planning as SAT. Our use of DeFault-FF is meant to be in the spirit of CA’s planner.

Fast or Low Risk:

One reviewer labeled our attempt to strike a balance between these concerns as an identity crisis. As in recent trends in satisficing planning (classical, conformant, etc.) we want high quality solutions, but not at the expense of returning no solution. This is born-out by our heuristics (as above) by measuring plan length before risk.

Conformant Probabilistic Planning (CPP):

There is a sound and complete translation to CPP that we have in a tech report, but we could not do it justice in this paper. The available CPP planners only solve very small problems ( < 30 incomplete features) because they are victim to numeric underflow when representing probabilities (i.e., 1/(2^{30}). Our larger instances have near 10,000 incomplete features, making off-the-shelf CPP far from applicable. For the problems solved by both CPP and our planner, performance was similar, but because of the precision issue, it is impossible to draw meaningful conclusions about scalability.

One final point, that we should have included in the paper, is that DeFault is highly similar to the POND planner (a CPP planner) because DeFault’s state representation (w/ failure sentences) is not unlike a belief state and the manner by which DeFault propagates failure sentences in the planning graph resembles POND’s heuristic based on labeled planning graphs.

Optimistic Semantics:

Indeed, the optimistic semantics resembles GraphPlan’s optimism, however our optimism is derived from the semantics of an ATMS (again, in our TR) where we assert every proposition that might be true and label each with the assumptions under which it may be false. Failing to assert a proposition as part of the state could rule out plans because we require that the known preconditions of an action be satisfied in a state (even if those known preconditions may not be true in all cases).

Figure 3:

The bands on the total time plot arise from associating the maximum time (1 hour) when an algorithm could not achieve the goal. The horizontal band at the top identifies the time taken by DeFault-FF when DeFault-BDD could not find a solution, and vice-versa for the vertical band at the left.

The fourth figure axes denote the proportion of domain interpretations that are consistent with the agent’s knowledge after achieving the goal.