Regarding the Main Cause(s) of the F-35A Fighter Jet Crash and Preventative Measures

The Air Self-Defense Force suffered the crash of an F-35A belonging to the 3rd Air WIng (Misawa AIr Base) on Tues. April 9, and currently have suspended F-35A fighter jets from flying.

The Air Self-Defense Force will be enforcing [new] education/training for F-35A pilots as a preventative measure, based on matters that have been made apparent up to this point regarding this accident.

1 An overview of the plane crash

(1) Date and time of the incident
31st year of Heisei (2019), April 9 (Tues.) 19:27 (the exact moment is estimated to be 17:26:30)

(2) Location of the incident
Out at sea to the east of Aomori Prefecture (out at sea approx. 135 km east of Misawa Air Base)

(3) Summary
An F-35A fighter jet belonging to the 3rd Air Wing 302nd Tactical Fighter Squadron (Misawa Air Base) took off from Misawa Air Base as the lead aircraft of a 4 plane formation around 18:59, and while conducting air combat training with the same aircraft type over training airspace east of Misawa, its communications stopped, radar signature vanished, and crashed.

(4) Pilot
Colonel Third Class Akinori Hosomi (41 years old)

2 Matters that have been made apparent up to this point
(According to things like datalink/ground-based radar records and what could be heard [from transmissions])

1) Around 19:25, the aircraft in question transmitted that it had succeeded in shooting down the 2 opposing aircraft during the training.

2) Around 19:26, the aircraft in question received orders from ground control to lower altitude to distance it from an approaching US military aircraft. It transmitted, “Understood. Roger,” and began a descending turn to the left (approx. 31,500ft altitude).

3) At approximately 19:26:15, the aircraft in question received orders from ground control to turn left to [further] distance itself from the US aircraft and after it finished turning left, it transmitted “Understood, knock it off (signaling a stop to the training).”

4) Around 19:26:30, the radar signature of the aircraft in question vanished, and crashed immediately after. During the 15 seconds between 3) ~ 4), [the aircraft] maintained a steep dive, with an average descent rate of over 1,100 km/hour. It was concluded that it crashed immediately after. Evidence of an attempt to eject could not be confirmed within that time frame. Furthermore, the aircraft was destroyed violently, and parts/fragments were spread out over the sea floor.

3 Analysis of the main cause(s)

(1) During the period between 1) ~ 3), the pilot is
   (a) Maintaining communication, but did not communicate anything that hinted something was abnormal with the aircraft.
   (b) Responded to ground control's instruction with "Understood. Roger," and after intentionally controlling the thrust and descent as well as the turn, responded with "Understood, knock it off."

   From these things, it can be concluded that at least during this time frame, the pilot was conscious and the aircraft was functioning normally.

(2) Regarding the possibility of the pilot losing consciousness or a problem occurring on the aircraft between 3) ~ 4), (approx. 15 seconds after responding with "Understood, knock it off."), losing consciousness due to hypoxia from falling at low altitude in a short amount of time is inconceivable. Regarding G-LOC*, malfunctions in the engine and flight controls as well as the electrical system among other things, it can be concluded there was a relatively low possibility of these occurring since it was confirmed that after the left turn, the pilot responded normally (with "Understood, knock it off"), and the fact that maneuvers, communications, and ejection due to an abnormality could not be confirmed.
   *G-LOC: G-force induced Loss Of Consciousness.

(3) Between 2) ~ 3), the average descent rate was over 900 km/hour and was over 1,100km/hour between 3) ~ 4) and was in a position of a steep dive, there was no possibility of a loss of thrust or failure of the aircraft structure, and since there was no sight of recovery attempts at extreme low altitudes where effective maneuvers are possible, it can be concluded that the pilot had fallen into "spatial disorientation" (a condition in which the sense of equilibrium is lost).

4 Countermeasures

(1) Implementation of measures against "spatial disorientation" which was highly likely [to have caused the crash]
   (a) Spatial disorientation education for F-35A pilots
   (b) Spatial awareness training for F-35A pilots as well as trainings done through simulators.

(2) Though the possibility of G-LOC and malfunction of engine/flight controls as well as the electrical system is relatively low, implementation of education regarding G-LOC to all F-35A pilots as well as special inspections on F-35As will be carried out, just in case.
    (a) Education regarding prevention of G-LOC to F-35A pilots
    (b) Special inspection of the F-35A fighter jet's airframe (engine and flight controls as well as the electrical system)