NIFA CRM/LOFT EVENT

You are the aircrew for a large corporation's Part 91 flight department. The flight you are conducting, like all the company's operations, is extremely time sensitive. Your routing, weather, and other pertinent information will be provided to you at the general contestant briefing. The flight will already be planned for you. You will need to familiarize yourselves with the route of flight, airports, weather, and NOTAMs. All required IFR charts will be provided on paper to you prior to your scheduled event. You may use your own electronic charts but it is your responsibility to have them available and functioning. Prior to starting the event, you will be given a short amount of time to ask questions and set-up in the simulator. The simulator you will be flying represents a generic piston multi-engine aircraft.

YOU ARE NOT BEING JUDGED ON YOUR MULTI-ENGINE FLYING SKILLS AND SYSTEMS KNOWLEDGE!!!!

We realize this is an aircraft you may not be familiar with, and therefore, we are not going to grade your ability to fly the aircraft, other than basic airmanship. No one will be allowed to use the autopilot or flight directors. The only pure flying skills that will be judged will be adherence to the simplified profiles that we provide (checklists, briefing guidelines, takeoff, landing, go-around procedures, etc.) as well as basic navigation and airmanship. We are also going to judge your compliance with the pertinent regulations that affect this flight (FAR Part 91, AIM considerations, etc.) and most importantly, your ability to work as a team in the cockpit.

You are going to be graded upon a number of items. Everyone will be graded upon the same criteria. To give you an idea of what the judges are looking for, here are some of the GENERAL items that will be evaluated:

- Is there a clear definition of cockpit duties?
- Are elements of CRM displayed?
  - -Command, Leadership, Resource Management, Communication, Situational Awareness, Decision Making, Workload Management, etc.
- Is someone always flying the airplane?
- Departure briefing
- Flight attendant briefing (if applicable)
- Approach briefing
- NAVAID set-up (Are radios pre-tuned and identified? Are OBS/HSI courses preset/correctly set? Transponder codes set? Etc.)
- Are cleared altitudes selected and verified?
- Are proper callouts made? (1000 feet to level off, approaching MDA/DH, course alive, etc.)
- Are checklists completed at the appropriate time and called complete?
- Are pertinent weather and NOTAMs discussed at the appropriate time?
- Are the simplified aircraft procedures followed?
- Are proper IFR procedures/FARs/AIM followed?

Obviously, this list could go on and on, but the above should give you a general idea of the items that the judges are looking for. Proper use of CRM should preclude errors in the judged areas. Small errors, when identified and promptly corrected, result in a lower total score.

A large amount of penalty points come from not having a clear division of duties between pilot flying (PF) and pilot monitoring (PM). The priority of the PF should be flying the airplane but they should still be part of the communication, decision-making, and overall awareness of the situation in all phases of flight. Many other duties (tuning radios, changing the heading bug, reading charts, etc.) are the job of the PM and should be done when directed by the PF. It is okay to transfer controls if the PF wishes to do their own briefings or panel set-up, but there should always be one pilot whose main focus is flying the aircraft.

During the scenario the judges will act as everyone you need to talk to. They will be ATC, FSS, flight attendant (if there is to be one), passengers, etc. If you need to talk to the passengers or flight attendant, turn around to face the judge behind you and treat him/her as your passengers or flight attendant. If you need to talk to someone in the ATC system, set up the radios and transmit as you normally would in a real aircraft. The judges will respond as the appropriate ATC/FSS facility if the radios are set up properly (proper frequency, transmitting on correct radio, etc.). ***If you have any questions about how to operate the simulator, please ask before we start your scenario.*** The judges cannot answer questions once the scenario has started, unless there is a problem with the simulator.

One important part of teamwork in the cockpit is good, concise crew briefings. Below are some suggested items that you might want to consider. The generic score sheet shows the exact items we are looking for.

PRE-DEPARTURE BRIEFING (COCKPIT)

Airspeeds	Wind	Rejected Takeoff
Altimeter Setting	Crew Duties	Clearance/SID
Flap Setting	Runway Condition	Terrain/Obstacles
Takeoff Power Setting		

PRE-DEPARTURE BRIEFING (PASSENGERS/FLIGHT ATTENDANT)

Emergency Procedures	Ground & Flight Delays	Destination Weather
Sterile Cockpit	Enroute Time	
Taxi Length	Enroute Weather	

APPROACH BRIEFING

Airport Name	MDA or DA	MA Procedure
Chart Index Number/Date	Airport/Runway Elevation	WX Minimums
NAVAIDS & Frequencies	MSA	Approach Speed
Final Approach Course	Missed Approach Point	Runway Exit Plan
FAF Crossing Altitude		

In order to successfully complete the CRM event, it is very important that the flight crew use the following standard callouts and procedures. You will be graded upon their proper usage.

Standard Callouts and Procedures

The following mandatory callouts will be utilized during the CRM/LOFT event. They simulate common calls made in the commercial aviation industry. The callouts will help keep both pilots focused on the task at hand. They are divided by pilot flying (PF) and pilot monitoring (PM) responsibilities. For example, just after rotation the PM will call "*positive rate*" when the altimeter and VSI indicate a positive climb. The PF will respond with "*gear up*." The PM then places the gear handle to the up position. These are not the only callouts the competitors should make. For example, if the PF is getting low on the glideslope, the PM should alert him/her of that fact. Good CRM is not limited by a list of standard callouts.

Takeoff

PF - "*Set Power*" while advancing the power levers toward takeoff power.
PM - "*Power Set*" after setting takeoff power by reaching under the PF's hand and further advancing the power levers to the takeoff power setting.

PM - "*V1, VR*" when the appropriate speeds are reached. They are usually the same speed in smaller aircraft. The PF will then rotate the aircraft to the initial pitch setting indicated in the profile.

PM - "*Positive Rate*" when the altimeter and VSI indicate a positive climb.
PF - "*Gear Up*" The PM then places the gear handle to the up position.

PF – "*Flaps up*" when the aircraft is 500 feet AGL, ***and*** airspeed is above 100 KIAS. The PM will then move the flap selector to the up position.

Climb

PF - "*Climb Checklist*" when the aircraft reaches 1,500 feet above the airport elevation. The PM will complete the items on the checklist to include the initial climb power setting. After this time it will be the responsibility of the PF to maintain the appropriate climb power setting.

Cruise

PF - "*Cruise Checklist*" when the aircraft reaches the final cruise altitude. The PM will again set the cruise power setting and complete the items on the cruise checklist.

PM - "*Course Alive*" when the navigation course indicator moves off full scale deflection.

Descent

PF - "*Descent Checklist*" The PF will call for the checklist as soon as practical after commencing the descent. The PM will then complete the items on the descent checklist.

Approach and Landing

PF - "*Approach Flaps*" The PM will set the approach flaps.

PF - "*Gear Down; Landing Checklist*" The PM will put the gear down and complete the items on the landing checklist.
PF - "*Landing Flaps*" The PM will set the final landing flap position.

Precision Approach

PM - "*Localizer Alive*" when the localizer course indicator moves off full scale deflection.

PM - "*Glideslope Alive*" when the glideslope indicator moves off full scale deflection.

PM - "*200 Above*" when 200 feet above the appropriate minimums for the approach.

PM - "*100 Above*" when 100 feet above the appropriate minimums for the approach.

PM - "*Minimums, Runway In Sight*" upon reaching the appropriate minimums for the approach if the runway is in sight.
OR;
PM - "*Minimums, Negative Runway*" upon reaching the appropriate minimums for the approach if the runway is not in sight.

Non-Precision Approach

PM - "*Course Alive*" when the final approach course indicator moves off full scale deflection.

PM - "*200 Above*" when 200 feet above the appropriate MDA for the approach.

PM - "*100 Above*" when 100 feet above the appropriate MDA for the approach.

PM - "*MDA, Runway In Sight*" upon reaching the appropriate minimums for the approach if the runway is in sight.
OR;
PM - "*MDA, Negative Runway*" upon reaching the appropriate minimums for the approach if the runway is not in sight. Note: This **does not** necessarily mean a missed approach should be executed at this point. Follow good IFR procedures.

PM – *"Missed Approach"* upon reaching the appropriate point for executing the missed approach procedure, with the runway not in sight.

Go-Around

PF - "*Max. Power, Approach Flaps*" while pushing the power toward max power and pitching the aircraft to the go-around pitch attitude. The PM will make the final adjustment to the power setting and set the flaps to approach if extended beyond the approach setting.
PM - "*Positive Rate*" when the altimeter and VSI indicate a positive climb.
PF - "*Gear Up*" The PM then places the gear handle to the up position. The PF will the call for flaps-up and the climb checklist in the same manner as the takeoff and climb procedures.

Miscellaneous

PM - *"_____ (name of checklist) checklist complete,"* when the final item on a checklist has been accomplished. No checklist is considered complete until it is called, "Complete."

PM - "*10,000 Feet* (or other appropriate altitude)" when a new altitude is assigned by ATC. The PM will set the new altitude into the altitude alerter and be sure the PF verbally responds to the change. The PM should point to the new altitude while verbalizing the new altitude, and continue pointing until the other pilot does the same. This helps to assure and altitude deviation does not occur.

PF - "*10,000 Feet* (or other appropriate altitude)" when the PM correctly sets a newly assigned altitude into the altitude alerter and verbally states it. They should also point to the altitude alerter until the other pilot does the same. This is a back-up check to assure an altitude bust does not occur.

PM - "*1,000 Feet To Level Off*" whenever 1,000 feet above or below the assigned altitude during a climb or descent. This does not apply to the MDA or DH of an instrument approach. Those calls are listed separately.

PM - "*100 Feet To Level Off*" whenever 100 feet above or below the assigned altitude during a climb or descent. This does not apply to the MDA or DH of an instrument approach. Those calls are listed separately.

CRM/LOFT Event
Piston Twin, Takeoff & Climb Profile

Takeoff Roll
- Flaps set to TO/APP
- Props full forward
- Complete Takeoff Checklist
- Release parking brake
- Set Full Power
- V1 at 80 knots, Rotate at 85 knots

Initial climb
- Pitch 7-8 degrees nose up
- When "positive rate" of climb is established (PM call):
    - "Gear up." (PF call)
- Follow departure procedure (if applicable).
- Above 500' AGL ***and*** >100 knots:
    - "Flaps up." (PF call)

1,500 feet above the airport
- Props 2,500 RPM
- Set Full Manifold Pressure
- 120 to 140 knots
- Complete Climb Checklist

Cruising altitude
- Props 2,400 RPM
- MP 24"
- Complete Cruise Checklist

CRM/LOFT Event
Piston Twin, Precision Approach Profile

Initial Arrival
- Obtain ATIS (must be done first)
- Brief approach
- Complete Descent Checklist
- Clean configuration

Approach Inbound or Outbound on Procedure Turn
- Flaps approach
- 140 knots

One Dot Low On Glideslope
- Landing gear down
- Complete Landing Checklist

Glideslope Intercept
- 100 to 120 knots
- Set altitude alerter to missed approach altitude

Visual and Landing Assured
- Full flaps
- Transition to V_{REF} (90 knots w/full flaps)
- Power to idle crossing the threshold

Missed Approach/Go-Around
- Max. power
- Pitch 10 degrees nose up
- Flaps set to TO/APP
- When “positive rate” of climb is established (PM call):
    - “Gear up.” (PF call)
- When clear of obstacles:
    - Pitch 7-8 degrees nose up
- Follow missed approach procedure
- Above 500’ AGL ***and*** >100 knots:
    - “Flaps up.” (PF call)
- Complete Climb and Cruise checklists as appropriate

Holding
- Landing gear up
- Flaps up
- 140 knots

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CRM/LOFT Event
Piston Twin, Non-Precision Approach Profile

Initial Arrival
- Obtain ATIS (must be done first)
- Brief approach
- Complete Descent Checklist
- Clean configuration

Station Passage on Outbound Leg
- Start timing
- Set altitude alerter
- 140 knots

Procedure Turn Outbound
- Start timing
- Flaps Approach
- 140 knots

Procedure Turn Inbound
- Reset altitude alerter (if required)

Approaching Final Approach Fix Inbound
- Set altitude alerter to MDA
- Configure (Landing gear down, flaps approach, 120 knots)
- Complete Landing Checklist

Final Approach Fix
- Start timing
-100 to 120 knots

Leveling off at MDA
- 100 to 120 knots
- Set altitude alerter to missed approach altitude

Visual and Landing Assured
- Full Flaps
- Transition to V_{REF} (90 knots w/full flaps)
- Power to idle crossing the threshold

Missed Approach/ Go-Around
- Reference Precision Approach Profile

Holding
- Reference Precision Approach Profile

CRM/LOFT Event Piston Twin Checklist

Before Start

Seats -	SET LEFT / SET RIGHT
Parking Brake -	SET
Fuel Quantity -	CHECKED
Instruments and Radios -	SET
Altimeters -	_ _._ _ SET LEFT / SET RIGHT
Flight Plan and Weather -	ONBOARD
Takeoff / Departure Briefing -	COMPLETE

Before Takeoff

Trims -	SET
Flaps -	T.O. / APP
Props -	FULL FORWARD

Takeoff

Transponder -	ON / ALT
Landing Lights -	ON

Climb

Landing Gear -	UP
Flaps -	UP
Climb Power -	FULL POWER SET
Propellers -	2,500 RPM
Landing Lights -	OFF

Cruise

Cruise Power -	SET (24” MP / 2,400 RPM)

Descent

Altimeters -	_ _._ _ SET LEFT / SET RIGHT
Landing Airspeeds -	BRIEFED
Passengers -	NOTIFIED
Approach Briefing -	COMPLETE

Landing

Landing Gear -	DOWN
Flaps -	APPROACH SET
Props -	FULL FORWARD
Landing Lights -	ON

Generic CRM/LOFT SCORE SHEET

The following generic score sheet gives examples of basic penalty points that will be assessed for errors made during the LOFT. The actual point values may vary greatly during the event given the gravity of the omission or error. All teams will be given the same penalty points for the same error or omission. This sheet is only intended to guide the contestants in the correct direction during their preparation.

EVENT	**PENALTY POINTS** (circle if penalty applies)
On ground before takeoff	
Departure Briefing - If they fail to cover...	
Airspeeds	10 points
Altimeter Setting	10 points
Flap Setting	10 points
Takeoff Power Setting	10 points
Wind	10 points
Crew Duties	10 points
Runway Condition	10 points
Rejected Takeoff	20 points
Clearance/DP	30 points
Terrain/Obstacles/Threats	30 points
Flight Attendant Briefing If they fail to cover...	
Emergency Procedures	25 points
Sterile Cockpit	10 points
Taxi Length	10 points
Ground and Flight Delays	10 points
Enroute Time	10 points
Enroute Weather	10 points
Destination Weather	10 points
Transponder Code not preset	10 points
If they miss any of the following in the clearance:	
Clearance limit	30 points
Route	30 points
Altitude	30 points
Frequency	30 points
Transponder code	30 points

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Before taxi

Before Start Checklist not completed or called complete	50 points
Comm radios not set-up	10 points
NAV radios not set-up	10 points

If they incorrectly set-up for the DP:

Incorrectly set OBS/HSI (± 3º)	10 points
Incorrectly set nav frequency	10 points
Fails to preset before taking the active runway	10 points
NAVAID(s) not identified	50 points
Fails to/won't likely make a crossing restriction	200 points
Before takeoff checklist not completed or called complete	50 points

During Takeoff

Takeoff checklist not completed or called complete	50 points
Improper takeoff procedure	20 points
Missed callouts:	
"Set Power"	5 points
"Power Set"	5 points
"V1/Vr"	5 points
"Positive Rate"	5 points
"Gear Up"	5 points

During Climb

Improper climb procedure	10 points
Fails to switch to departure	10 points
Climb checklist not completed or called complete	50 points
Altitude bust	200 points
Fails to keep needle within ½ scale during DP	100 points
Full-scale needle deflecting during DP	200 points

Enroute navigation once cleared on course	
Proper VOR's not selected	10 points
TO/FROM indication not proper	10 points
VOR's not identified	50 points
HSI/OBS not set properly (± 3º)	10 points
"Course alive" not called	10 points
Fails to intercept course within 10 nm	20 points
Pass ½ waypoint of airway and fails to switch VOR's	15 points
Fails to identify VOR's	50 points
Fails to set-up VOR's (± 3º)	10 points
"1,000 feet to level off" not called	10 points

During Cruise

Cruise checklist not completed or called complete	50 points
Pass ½ waypoint of airway and fails to switch VOR's	15 points
Fails to identify VOR's	50 points
Fails to set-up VOR's (± 3º)	10 points
Excessive airway deviation (> ½ scale)	40 points
Approaching any change in course (within 3 minutes) and fails to set-up for bend in airway	20 points
Fails to set 29.92 at FL180	200 points

During Arrival

Fails to get or consider weather/NOTAMS	350 points
Gets weather/NOTAMS after choosing to divert (if applicable)	100 points
Fails to reset local altimeter setting when descending below FL180	200 points
Deviate from controller vectors	100 points
Fails to include passengers in decision-making if diverting	50 points
Descent checklist not completed or called complete	50 points
Arrival not announced to flight attendant/passengers	30 points
Fails to keep needle within ¾ scale deflection during arrival	75 points
"1,000 feet to level off" not called	10 points

Precision Approach

Approach Briefing If they fail to cover...

Name of Airport	10 points
Approach Chart Index Number/Date	10 points
NAVAIDS and Frequencies	10 points
Final Approach Course	10 points
Initial Approach Altitude(s)	10 points
Glideslope Intercept Altitude	10 points
FAF/Crossing Altitude	10 points
Decision Altitude	10 points
Airport Elevation/TDZE	10 points
Minimum Safe Altitude	10 points
Missed Approach Procedure	10 points
Weather Minimums	10 points
Approach Speed	10 points
Runway Length and Exit Plan	10 points
Appropriate NOTAMS	10 points

Briefs the wrong approach	150 points

Fail to set-up properly for approach while receiving vectors

Radios not pretuned after receiving vector	10 points
ILS not identified	50 points
OBS/HSI not set-up	10 points
OM/MM not set up	10 points

Procedure Turn (if applicable)

Fails to do procedure turn	100 points
Time not used for procedure turn	20 points
Completes procedure turn incorrectly	50 points
Exceeds 10 nm from the FAF/FAP	50 points
Reverse sensing inbound from procedure turn	30 points
Approach flaps not set	10 points
"Localizer Alive" not called out	10 points
Localizer not intercepted	50 points
"Glideslope Alive" not called out	10 points
Glideslope not intercepted	50 points
"Gear Down; Landing Checklist" not called	10 points
Landing checklist not completed or called complete	50 points
Excessive localizer and/or glideslope deviations	
Outside final approach fix	50 points
Inside final approach fix	150 points

Full scale localizer and/or glideslope deviations	
Outside final approach fix	100 points
Inside final approach fix	300 points
Missed Callouts	
- "200 above"	10 points
- "100 above"	10 points
- "Minimums; runway in (not in) sight	10 points
- "Landing Flaps" not called	10 points
Land without landing flaps set	30 points
Unable to land from the approach due to pilot error	50 points
Failure to turn on pilot controlled lighting	75 points

Go-Around (if applicable)

Continuing below DA before calling for missed approach	300 points
"Max Power/Approach Flaps" not called	10 points
"Positive Rate/Gear Up" not called	10 points
Improper Go-Around power setting	10 points
Improper Go-Around configuration	20 points
Should have gone missed but didn't	350 points
Turn started too early/late during go around	100 points
Missed approach not set up during the approach or approach brief	100 points
Missed approach not set up properly by PNF	50 points
Hold not discussed properly/timely manner	30 points

Non-Precision Approach

Approach Briefing If they fail to cover…	
Name of Airport	10 points
Approach Chart Index Number/Date	10 points
NAVAIDS and Frequencies	10 points
Final Approach Course	10 points
Initial Approach Altitude(s)	10 points
FAF/Crossing Altitude	10 points
Minimum Descent Altitude	10 points
Airport Elevation/TDZE	10 points
Minimum Safe Altitude	10 points
Missed Approach Point	10 points
Missed Approach Procedure	10 points
Weather Minimums	10 points
Approach Speed	10 points
Runway Length and Exit Plan	10 points
Appropriate NOTAMS	10 points
Briefs the wrong approach	150 points
Fail to set-up properly for approach while receiving vectors	10 points
Radios not pretuned once on vector	10 points
VOR/LOC/NDB not identified	50 points
HSI/OBS not set-up (± 3^{o})	10 points

Procedure Turn (if applicable)

Fails to do procedure turn	100 points
Time not used for procedure turn	20 points
Completes procedure turn incorrectly	50 points
Exceeds 10 nm from the FAF/FAP	50 points
Reverse sensing inbound from procedure turn	30 points
Approach flaps not set	10 points
"Course Alive" not called	10 points
Course not intercepted	50 points
Fails to start time at FAF/FAP	20 points
"Gear Down; Landing Checklist" not called	10 points
Landing checklist not completed or called complete	50 points
Excessive course deviations	
Outside final approach fix	50 points
Inside final approach fix	150 points
Full scale course deviations	
Outside final approach fix	100 points
Inside final approach fix	300 points
Missed Callouts	
- "200 above"	10 points
- "100 above"	10 points
- "Minimums; runway in (not in) sight	10 points
MDA deviations during approach	300 points
(-50 feet for 5 seconds, -100 feet for 1 second, or +100 feet for 5 seconds)	
"Landing Flaps" not called	10 points
Land without landing flaps set	30 points
Unable to land from the approach	50 points
Failure to turn on pilot controlled lighting	10 points

Go-Around (if applicable)

Go Around not executed in a timely manner	100 points
"Max Power/Approach Flaps" not called	10 points
"Positive Rate/Gear Up" not called	10 points
Improper Go-Around power setting	10 points
Improper Go-Around configuration	20 points
Should have gone missed but didn't	350 points
Turn started too early/late during go around	20 points
Missed approach not set up during the approach or approach brief	100 points
Missed approach not set up properly by PNF	50 points
Hold not discussed properly/timely manner	30 points

Holding

Fails to get EFC time	100 points
Gets EFC time after entering hold	50 points
Reverse sensing	30 points
Wrong radial/bearing	100 points
Hold on wrong side (Incorrect turn direction)	100 points
Fails to start time/hold to wrong distance	100 points
Fails to report entering hold	10 points
Improper configuration	10 points
Improper speed (±20 knots)	10 points
Exceed allotted holding fuel	300 points

Errors that result in an Undesired Aircraft State (UAS)

(Same points not deducted elsewhere - explain next to deduction)

Safe outcome of flight seriously in doubt	DQ
Crash	DQ
Gross navigational error	500 points
Deviation from ATC clearance	300 points
Rate of descent is twice AGL altitude	300 points
Exceed basic aircraft limitation	300 points
Fails to cancel IFR at non-towered airport	200 points
Altitude bust (±200 feet)	200 points
Heading bust (±20^{o})	100 points
ATC not notified of cruise speed changed more than 5% or 10 knots	100 points
Rough handling of the simulator	100 points
Fails to set altitude alerter properly	100 points
Fails to identify (verbally or non-verbally) altitude alerter changes	50 points

Please note that this is a GENERIC score sheet. It will be different than the actual score sheet used in that the actual event score sheet will reflect the specific details of the LOFT scenario. For instance, if the scenario does not involve a non-precision approach then the score sheet will not contain any penalties for a non-precision approach. Specific courses, routes, headings, altitudes, etc., pertaining to the scenario will be spelled out on the score sheet.

It is also possible that the event score sheet may have penalty point values different than those for the same error on the generic score sheet. This is often the case when that error, committed in the LOFT scenario, poses a greater hazard than usual. For example: The normal penalty for a full scale CDI deflection on a departure procedure is 200 points. If the scenario contains a DP that is in mountainous terrain, the point value may be increased to reflect the greater danger that error presents.

2019 NIFA CRM/LOFT Event
Panel Configuration

The Redbird device will have dual yokes, pitch and rudder trim, and a center power quadrant with throttles, prop levers, and mixture controls. The function of all knobs and dials will be reviewed during practice session. The autopilot will function solely as an altitude alerter. Use of GPS will be limited and briefed further during practice session.

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