

Aviation weather guidelines

Report No. 369
October 2005



**International
Association
of Oil & Gas
Producers**



Publications

Global experience

The International Association of Oil & Gas Producers has access to a wealth of technical knowledge and experience with its members operating around the world in many different terrains. We collate and distil this valuable knowledge for the industry to use as guidelines for good practice by individual members.

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Table of contents

1	General	2
2	Operating environment and weather	2
2.1	Hostile vs. non-hostile environments.....	2
2.2	Risk factors	2
2.3	Hostile environment aircraft recommendation.....	2
2.4	Non-hostile environment aircraft recommendation	2
3	Flight rules and weather	3
3.1	Instrument Flight Rules (IFR)	3
3.3	Table - VFR weather minimums	3
3.4	Weather reports.....	3
3.5	Adverse weather planning.....	4
4	Offshore helicopter weather limits and reporting	6
4.1	Limitations.....	6
4.2	Floating helidecks - pitch, roll, heave and additional weather limitations/guidelines .	6
5	Offshore helicopter adverse weather operational limitations	7
5.1	Purpose.....	7
5.2	Factors to consider	7
5.3	Precautionary weather conditions.....	7
5.4	Emergency weather conditions	7
5.5	Flow charts for decision-making.....	7

I General

This document is provided as a guide for planning and operational decision making in regard to weather, both adverse and routine, and the impacts of weather criteria on aircraft selection/operation. It is designed for use for all aircraft operations, both airplane and helicopter, and for onshore/offshore operations.

2 Operating environment and weather

2.1 Hostile vs. non-hostile environments

In determining the type of aircraft and the operational parameters to be specified for a specific project, the user should first determine the type of operating environment using the definitions of hostile and non-hostile in the OGP *Aviation management guide*[†] (section 1.5) and with further detail, including weather considerations, as noted in chart 1.

2.2 Risk factors

Factors to be considered in determining the environment include local topographical considerations, weather and temperature conditions, restrictions to visibility, type of operation, and search and rescue resources in the area of operation. See chart 2 for a matrix of typical related weather factors.

2.3 Hostile environment aircraft recommendation

A twin engine aircraft able to sustain one engine inoperative (OEI) flight in cruise should be specified for operations in a hostile environment. See chart 1.

2.4 Non-hostile environment aircraft recommendation

2.4.1 Non-hostile environment definition

An environment can be considered non-hostile subject to satisfactory review/mitigation of each of the three points identified in the definition in the OGP *Aviation management guide* (section 1.5.3) and the criteria shown in chart 1.

2.4.2 Non-hostile environment aircraft requirements

Single engine aircraft that have been satisfactorily reviewed may be used in a non-hostile environment. See chart 1.

[†] *Aviation management guide* – <http://www.ogp.org.uk/pubs/239.pdf>

3 Flight rules and weather

3.1 Instrument Flight Rules (IFR)

IFR operations should comply with local regulatory IFR weather minimums unless more stringent company requirements are issued.

3.2 Visual Flight Rules (VFR)

VFR weather minimums are contained in Table 3.3.

Local regulatory minimums are to be followed when their guidance is more conservative than those contained in Table 3.3. or in mission specific weather minimums presented in other sections of the *Aircraft management guide*.

3.3 Table - VFR Weather Minimums

Flight Regime	Minimum operating height ¹	Cloud base (feet)	Visibility (SM)	Requirements to fly given these weather minimums ²
Offshore – Day	500 feet ^{3,4}	600 feet	3 SM ^{3,4}	No special requirements
	400 feet, local authority permitting	500 feet	1/2	Offshore helo interfield use only if visual contact is maintained with other facilities.
Overland – Day	500 feet ³	600 feet	3 SM ³	No special requirements
All Night Ops	Night flights will be flown using IFR procedures and minimums when available, otherwise the VFR minimum shall be a cloud base of 1000 feet with 100 feet of vertical cloud clearance and 3 SM visibility.			Twin engine IFR certified aircraft with dual IFR-night current crew. All night flights should utilize IFR cockpit procedures for takeoffs and landings.

- 1 The minimum operating height refers to the height Above Ground Level (AGL) for overland flights, and the height Above Mean Sea Level (AMSL) for offshore flights.
- 2 VFR Flights may not depart or continue if the weather conditions at departure, enroute or the destination are below the above stated minimum.
- 3 Minimum operating height for Day VFR less than a ceiling to 600 feet (inclusion of 100 feet of cloud clearance) and visibility to 2 SM may be allowed if the procedures are authorized by the appropriate authority.
- 4 When lower minimums are used, it is recommended that only those twin engine IFR certified with a dual pilot IFR current crew be used.

3.4 Weather reports

3.4.1 Providing accurate aviation weather for both current and forecast conditions should be a priority for all flight operations.

3.4.2 Use of personnel trained and certified as aviation weather observers or an Automated Weather Observation System (AWOS) which also provides certified aviation weather are recommended for long term projects, where appropriate.

3.4.3 When provided, weather reporting equipment should be capable of determining the following information: wind speed and direction, barometric pressure, temperature, visibility, and ceiling height. Sea state should also be provided for helideck operations. For floating facilities, helideck pitch, roll and heave data should be provided.

3.5 Adverse weather planning

3.5.1 Purpose:

The purpose of *Adverse weather guidelines* is to provide open dialog between the operator and the company local aviation contact when weather conditions become marginal for normal aircraft operations. The dialog may identify mitigating measures necessary to continue operations at an equivalent level of safety or result in the decision to suspend operations.

- Companies should perform a localised risk analysis to determine if a localised Adverse Weather Policy is needed. The recommended Adverse Weather Policy for offshore helicopter operations is noted in paragraph 5 below.
- All factors, including discussions with the operator, should be reviewed in establishing local adverse weather operational limits.
- At its discretion, the company may choose to delay or cancel a flight, even when conditions are technically within limits, should it choose to do so.
- The Operator's Operations Manuals may have more restrictive guidelines than those listed in this document.

3.5.2 Factors to consider:

Among the factors to be considered in determining if flights should be performed in adverse weather are those listed below:

- Operator's compliance with regulatory, aircraft operator's Operations Manual, and company's weather and operational limitations.
- Safe movement of passengers and operation of the aircraft at the landing/departure site.
- Rescue provisions, which will provide a reasonable expectation of rescue both enroute and at the landing site, in the event of a forced landing.
- Degree of urgency of the proposed flights.

3.5.3 Precautionary weather condition zone:

When conditions have become marginal or reached any of the criteria listed below, the situation may be considered to have reached the “adverse” level; company review or intervention may be justified and “routine” flights may be curtailed.

- High wind speed or gust spread: aircraft Flight Manuals have operational limits for both speed and gust spread to be considered, but in any case when wind speed reaches 53-59 knots, companies should consider:
 - specialised passenger handling procedures, and
 - advising inbound flights of the weather conditions.
- Weather less than 600 foot (180m) ceiling and 3 miles (5km) visibility (see Table 3.3) require IFR capable multi-engine aircraft and crew.
- Severe loose dust or blowing snow or other conditions at the landing site that may inhibit visibility requires specialised pilot training and/or operational procedures.
- Severe cold conditions below minus 29°C (-20F) may require specialised passenger and aircraft handling procedures.
- Any other conditions established for this Zone by the company.
- The aircraft crew or company will communicate that Precautionary Limits have been reached, will advise the company local aviation contact, and jointly they will reach agreement on whether flights should continue or be delayed.
- The company supervisor responsible for aircraft operations should review all proposed aircraft activities to determine whether such flights are essential to meet company objectives or if they should be delayed. When delaying flights, the supervisor may consider prioritising as noted below:
 - flights for visits by non-operational staff or other non-essential flights; and
 - flights for routine crew changes.
- Where a number of the criteria above exist simultaneously or if the flights will be at night, the supervisor should assume that the risk level will be higher.

3.5.4 Emergency Weather Condition Zone:

The guidelines below should be followed when considering the curtailment of routine or precautionary flights, or the restriction of aircraft operations to emergency-only activities.

- Operation in winds above 60 knots are not recommended.
- Operations at surface temperatures below -40°C (-40°F) are not recommended.
- For floatplanes less than 5,700kg MGTOW, recommend no water landings with sea state above one foot. For amphibious floatplanes, no landings below -1°C (+30°F).
- Any other conditions established for this Zone by the company.
- Flights in this Zone are normally performed only with multi-engine IFR equipped aircraft and dual IFR qualified pilots.
- The flight crew or company will communicate whether guideline limits have been reached, and all flights should be delayed, except for life-saving flights.
- Qualified medical advice should be sought before launching an emergency flight for medical reasons, in order to establish that the risk facing the patient exceeds the risk to the aircraft and crew. Any adverse factor that may affect the safe accomplishment of the medical evacuation flight should be considered in this analysis.
- Landing areas should be considered unsafe for personnel engaged in routine or precautionary operations.

4 Offshore helicopter weather limits and reporting

4.1 Limitations

Table 3.3 and section 5 provide offshore weather limitations and procedures to be followed for adverse weather.

4.2 Floating helidecks – pitch, roll, heave and additional weather limitations/guidelines

Conditions	Limits for Landing		Limits for Planning	
	Day	Night	Day	Night
Pitch & roll	+3°	+2°	+3°	+2°
Average heave rate	1.0m/s	0.5m/s	1.3m/s	0.5m/s

4.2.1 Measurement of Pitch, Roll and Heave (PRH):

- A method of measuring PRH shall be available and a means provided to transmit that data to flight crews prior to landing. The accelerometers for such measurements should be located as close to helideck level and centerline as possible to provide accurate readings. Accelerometer readings processed by sophisticated software may provide accurate helideck level measurements of PRH regardless of the accelerometer location. Provided the system is operational, such calculations may be used for pilot information.
- If the PRH measurement system is capable of recording accurate helideck movements for at least ten minutes and can calculate the average heave rate, then less restrictive limits than those indicated in the chart above may be applied to specific floating facilities. Such variances must be allowed in the local operator's Operations Manual, and be documented in the local helideck operating procedures/diagrams and facility helideck procedures. Company Aviation Advisors should be consulted for relevant guidance before the variances are implemented.

4.2.2 When a vessel provides permission for a helicopter to land on deck and has advised the deck is clear, the vessel should maintain the existing heading while the helicopter remains on the deck. The monitoring station providing deck motion limits and wind data must be manned during the entire time the helicopter is operating on the deck.

4.2.3 The helicopter crew is to be notified immediately by radio if any of the following occurs: the vessel goes off heading by 10 degrees or more, there is a vessel/installation or station keeping/handling problem, pitch/roll/heave exceeds the limits in the Table 4.2, a significant change in the relative wind of 30 degrees or more, or there is any other abnormal event.

4.2.4 The operational limitations for helicopter operations on monohull vessels with helidecks greater than or equal to eighty (80) feet (25m) above sea level are more restrictive than the chart above, may vary by helicopter model, and prior to operation on such vessels, company Aviation Advisors should be contacted for relevant guidance.

4.2.5 Deck Limitations are not applicable for takeoff from the helideck.

5 Offshore helicopter adverse weather operational limitations

5.1 Purpose

See paragraph 3.5 for general planning guidance for adverse weather.

5.2 Factors to consider

Guidelines for flights performed in adverse weather, in addition to those listed in section 3.5, are the following:

5.2.1 Safe movement of passengers and operation of the helicopter on the helideck

- Assign helideck assistance as necessary.
- Consider changing passengers out 1-1, 2-2, *etc.*
- Consider use of a helideck rope from the stairwell to a location adjacent to the helicopter (do NOT tie the rope to the helicopter).
- Brief passengers on special helideck procedures.

5.3 Precautionary weather conditions

When conditions broadly reach any of the criteria listed below, and those shown in paragraph 3.5.3, the situation may be considered to have reached the “Adverse” level, where company review/intervention may be justified (see Chart 2).

- Windspeed 53-59 knots
 - Suspend flights to unmanned structures
 - Implement special passenger handling procedures (paragraph 5.2.1 above)
 - Advise inbound flights of weather conditions
 - Implement Search and Rescue (SAR) procedures for adverse weather
- Significant wave height above 5.5 meters, but less than 7.0 meters.
- Weather less than 600-foot ceiling and 3 miles visibility (see Table 3.3). IFR capable helicopter and crew required.
- Pitch, roll, and heave exceeding the guidelines in paragraph 4.2. for floating offshore structures.
 - The helicopter Flight Manual and Operator’s Operations Manual should be reviewed to determine if landings are possible.
 - If no criteria exists for the model being flown, then the criteria listed above apply.
- Flights in this zone are normally performed only with multi-engine helicopters.
- The helicopter crew communicate whether Precautionary Limits have been reached, will advise the company local aviation contact, and jointly they will reach agreement on whether flights should continue or be delayed.
- The company supervisor responsible for operations should review all proposed helicopter operations, to determine whether such flights are essential to meet Company objectives, or should be delayed. In addition to the items listed in paragraph 3.5.3, companies should also consider delaying flights to unmanned structures.
- Where a number of the criteria above exist simultaneously or if the flights will be at night, the supervisor should assume that the risk level will be higher.

5.4 Emergency weather conditions

Only emergency operations should be attempted when conditions reach those shown in paragraph 3.5.4 and those indicated below. See chart 2.

- Snow or ice accumulation on the helideck.
- Sea spray blowing across helideck.
- Significant Wave height above 7.0 meters.
- Pitch, roll, and heave on floating structures exceeding the limitations for helicopter operations as listed in section 4.2.

During emergency weather conditions, the following guidance applies:

- Flights in this zone are normally performed only with multi-engine IFR capable helicopters and dual IFR qualified pilots.
- The helicopter flight crew will communicate that guideline limits have been reached, and all flights should be delayed, except for life-saving flights.
- Qualified medical advice should be sought before launching an emergency flight for medical reasons, in order to establish that the risk facing the patient exceeds the risk to the helicopter and crew.
- Platform supervisor considers helideck unsafe for personnel for routine operations.

5.5 Flow charts for decision-making

Chart 2 is designed to assist local Aviation Contacts and managers in decision making during adverse weather and chart 1 to assist in determining Hostile versus Non-hostile environments. It is not intended to be the sole determining factor. Comprehensive knowledge of local environments is also vital in making informed decisions.

Chart 1 – Hostile/non-hostile environment aircraft considerations

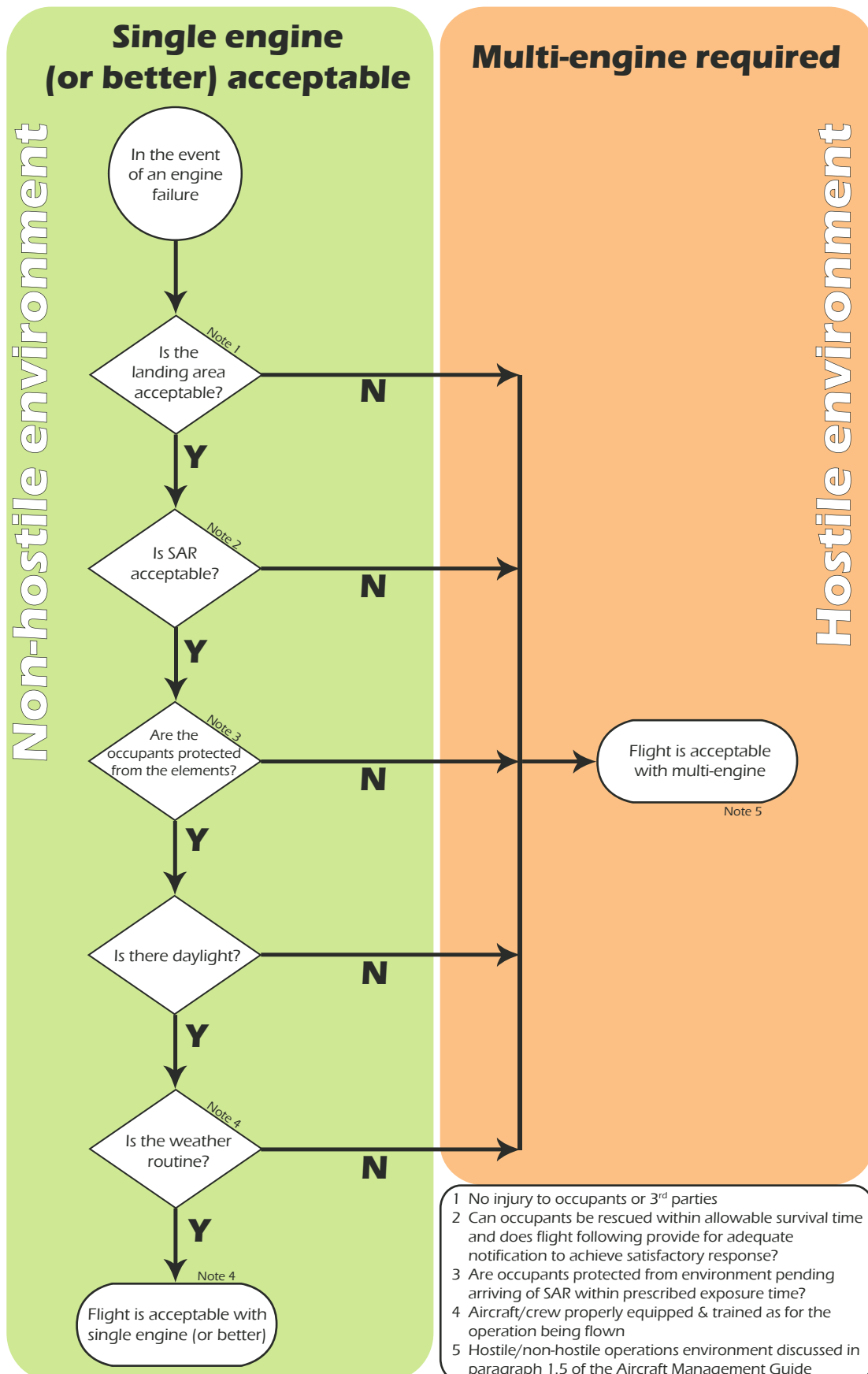
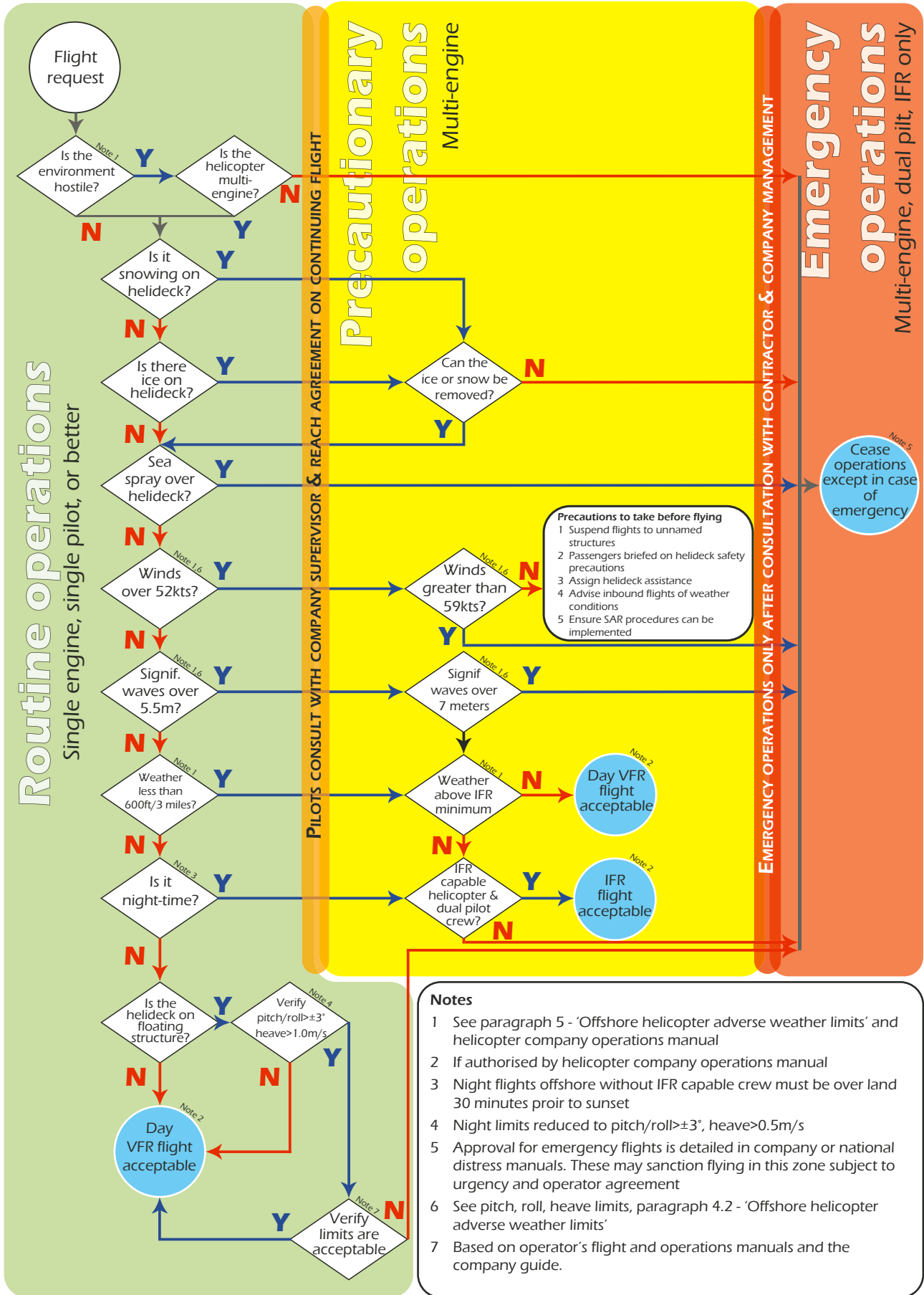


Chart 2 – Offshore helicopter adverse weather planning considerations



What is OGP?

The International Association of Oil & Gas Producers encompasses the world's leading private and state-owned oil & gas companies, their national and regional associations, and major upstream contractors and suppliers.

Vision

- To work on behalf of all the world's upstream companies to promote responsible and profitable operations.

Mission

- To represent the interests of the upstream industry to international regulatory and legislative bodies.
- To achieve continuous improvement in safety, health and environmental performance and in the engineering and operation of upstream ventures.
- To promote awareness of Corporate Social Responsibility issues within the industry and among stakeholders.

Objectives

- To improve understanding of the upstream oil and gas industry, its achievements and challenges and its views on pertinent issues.
- To encourage international regulators and other parties to take account of the industry's views in developing proposals that are effective and workable.
- To become a more visible, accessible and effective source of information about the global industry – both externally and within member organisations.
- To develop and disseminate best practices in safety, health and environmental performance and the engineering and operation of upstream ventures.
- To improve the collection, analysis and dissemination of safety, health and environmental performance data.
- To provide a forum for sharing experience and debating emerging issues.
- To enhance the industry's ability to influence by increasing the size and diversity of the membership.
- To liaise with other industry associations to ensure consistent and effective approaches to common issues.



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