

Lake County, Illinois
Radio Amateur Civil Emergency Service
Amateur Radio Emergency Service



**SKYWARN STANDARD OPERATING PROCEDURES
(SKYSOP)**

**PHASE 1
*SEVERE WEATHER OPERATIONS***

SKYSOP-000-02-2006
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2006

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RACES/ARES SKYWARN Watch Area

WISCONSIN

Walworth

Racine

Kenosha

ILLINOIS

BOONE

DeKalb

McHenry

Kane

Lake

DuPage

Northern Cook

DUTIES OF EOC OPERATIONS

INCIDENT_COMMANDER

The incident commander oversees and directs the entire operation.

F1 (PENS) Operator

Will read statements of severe weather watches and warnings only.

RACES PRIMARY NET OPERATOR

Will read statements of severe weather watches and warnings. Handling of all net control operations including but not limited to;

- Check-ins
- Severe Weather Reports
- Priority and Emergency Traffic
- Severe Weather Statements
- Special Marine Warnings
- Radar Reports
- Special Weather Statements

UHF OPERATOR

Under ideal conditions will read severe weather watches and warnings as well as priority severe weather information.

Will monitor for traffic that cannot be passed via main repeater.

DATA COORDINATOR

Responsible for logging activities and keeping a record of events.

Responsible for handling weather statements. All printed copy will be given to Incident Commander before passing to any other operators.

FREQUENCY MONITOR

Responsible for monitoring surrounding county operations and RACES/ARES Quad Frequencies.

WEATHER OFFICER

Responsible for keeping the Incident Commander updated on current weather events.

Use of radar in several operating modes, Storm Prediction Center (SPC) operations along with Internet knowledge of various weather sites is helpful.

OPERATING STATIONS

IDEAL SITUATION:

INCIDENT COMMANDER

Net Control Operator

F1 (PENS) Control Operator

UHF Operator

Frequency Monitor

Data Coordinator

Weather Officer

SUGGESTED OPERATORS:

INCIDENT COMMANDER

Net Control Operator

F1 (PENS) Control Operator

Data Coordinator

Weather Officer

OPERATIONS EQUIPMENT

RADIO: MAIN

**F1 (PENS) PUBLIC EMERGENCY
NOTIFICATION SYSTEM**

**W9FUL RACES REPEATER (147.180)
LIBERTYVILLE**

**UHF AFFILIATED REPEATER (443.850)
LAKE ZURICH**

CHICAGO SKYWARN ASSOCIATION (442.975)

HF OPERATIONS

WEATHER:

**WEATHERTAP REAL TIME RADAR
(18 AVAILABLE MODES) INTERNET BASED**

**ACCUWEATHER REAL TIME RADAR
(21 AVAILABLE MODES) INTERNET BASED**

EMWINS DATA FEED (SATELLITE FEED – INTERNET BACK UP FEED)

**SAME NOAA WEATHER RADIOS
(CHICAGO - MILWAUKEE - ROCKFORD)**

NOAA SAME WEATHER RADIO FREQUENCIES

162.550 – KWO39 Chicago (Lake, Cook, DuPage)

162.425 - KZZ 81 Lockport (McHenry, Lake, Kane, DuPage and Cook)

162.500 – KXI-41 Crystal Lake (Boone, McHenry, Lake, Kane)

163.400 – KEC 60 Milwaukee (Walworth, Kenosha and Racine)

162.475 – KZZ 57 Rockford (Boone and DeKalb)

These are updated frequency and county listings.

SEVERE WEATHER OPERATIONS

LEVELS OF ACTIVATION:

SEVERE WEATHER AWARENESS LEVEL:

Severe Weather Outlook indicates a risk of severe weather development

SEVERE WEATHER ADVISORY LEVEL:

Storm Prediction Center has issued a mesoscale discussion, which involves part or all of (RACES/ARES Watch Area)

SEVERE WEATHER WATCH LEVEL:

Storm Prediction Center has issued a Severe Weather Watch, which involves part or all of (RACES/ARES Watch Area)

SEVERE WEATHER WARNING LEVEL:

National Weather Service in Chicago or Milwaukee has issued a warning in any (RACES/ARES Watch Area)

SEVERE WEATHER SHORT FUSE LEVEL:

National Weather Service in Chicago or Milwaukee has issued a warning in any (RACES/ARES Watch Area) without the advance of any other a Severe Weather Watch.

**LAKE COUNTY RACES/ARES
TIME OF RESPONSIBILTY**

SUNDAY: 12:00am - 11:59pm

MONDAY: 12:00am - 6:59am

4:00pm - 11:59pm

TUESDAY: 12:00am - 6:59am

4:00pm - 11:59pm

WEDNESDAY: 12:00am - 6:59am

4:00pm - 11:59pm

THURSDAY: 12:00am - 6:59am

4:00pm - 11:59pm

FRIDAY: 12:00am - 6:59am

4:00pm - 11:59pm

SATURDAY: 12:00am - 11:59pm

Other times not listed will be a county responsibility; however, RACES/ARES can supplement if available.

ORDER OF ACTIVATION

SEVERE WEATHER AWARENESS LEVEL:

SEVERE WEATHER OUTLOOK ISSUED BY Storm Prediction Center (SPC) INDICATING POSSIBLE SEVERE WEATHER DEVELOPMENT

Outlook paged by N9VID or Weather Officer at 8AM and additionally as needed.

Second and third duty officers will notify the first duty officer of availability. If a response is not received within two hours of the expected time of the severe weather risk to begin, first duty officer will find an alternate replacement who will handle secondary duties until an officer becomes available.

In the event that all duty officers are unavailable, first officer will find an alternate to handle duties until one becomes available.

First duty officer will also assign a weather officer based on availability and this officer will now be on call.

No statement needs to read on the RACES/ARES primary repeater.

SPC ADVISORY:

SPC MESOSCALE DISCUSSION INDICATING POSSIBLE SEVERE WEATHER WATCH

Upon SPC mesoscale discussion involving (RACES/AREAS Watch Area), weather officer/duty officer will issue SPC Advisory to all Accuweather paging members and this statement will be issued on the RACES primary repeater.

This statement will be repeated every 30 minutes.

The repeater remains open for normal operations.

To see if mesoscale discussion involves RACES/AREAS Watch Area, go to;
<http://www.spc.noaa.gov> - click on Current Mesoscale Discussion - click on the valid discussion.
Should a visual map not be available, issued advisory in the following conditions;
Northern Illinois and/or Southern Wisconsin are listed in the text discussion.

SEVERE WEATHER WATCH:

Upon SPC issuance of Severe Weather Watch involving RACES/ARES Watch Area, all Accuweather paging members will be notified automatically.

It is the weather officer/duty officers or alternates to verify accuracy and determine if members have been notified.

Severe Weather Watch will be issued immediately.

F1 (PENS) is issued first and then RACES primary repeater depending on location. If off site, Lake County Sheriff's department will issue Severe Weather Watch on F1 (PENS).

This Severe Weather Watch will be repeated every 20 minutes on the RACES/ARES primary repeater. Macro will announce at the end of every transmission when enabled.

All duty officers that reported as available are to report to the EOC immediately.

Weather officer, if not an active duty officer remains on call and can remain offsite provided they have unlimited communication with the EOC.

First arrival at EOC assumes Incident Command. If this is not a duty officer, first on the scene will remain Incident Commander until a duty officer arrives.

Duty officer will then assume command unless designated otherwise.

Incident Commander will determine via several means whether additional members will be needed.

The RACES repeater will now operate in a restricted mode.
All traffic, except severe weather, priority and emergency, will be limited to 3 minutes.

SEVERE WEATHER WARNING:

National Weather Service will issue a severe weather warning for an area in the county watch area.

The counties in the warning criteria area; Walworth, Kenosha, McHenry, Kane, Lake or Northern Cook.

Warning will be issued via Accuweather paging automatically.
Incident Commander will authorize release of the warning on F1 (PENS) followed by RACES primary repeater and declare an operating net.

This statement will be issued on the RACES/ARES repeater every 5 minutes. The enabled macros will announcement at the end of every transmission.

Incident Commander via discussion with the weather officer will determine which quadrants will require check-in. Determining quadrants will help shift available resources to those quadrants that are more directly affected and allow more available time for net control.

WARNING LEVEL CRITERIA does not require the issuance of a severe weather warning. If the Incident Commander determines after discussion with the weather officer, that a threat of severe weather could occur, a warning level will be issued.

Under these conditions, a Weather Alert Macro will be enabled. Macros are only used if Lake County is directly involved.

A directed net will begin after Incident Commander authorization. The repeater is closed to normal operations. All traffic must pass through net control.

Check-ins will be taken 60 seconds after the release of the warning statement or the threat of severe weather on the RACES/ARES primary repeater.

SEVERE WEATHER SHORT FUSE LEVEL:

Severe Weather Warning issued without the advantage of a previous watch

Short fuse Severe Weather Warnings can occur without the advantage of a **Watch Level, Advisory Level or an Awareness Level.**

In this event, duty officers are responsible for directing a net. It is likely that a directed net may not occur for up to 15 minutes after the warning is issued. These are just the perils of a short fuse warning.

Net operator will read issued warnings over F1 (PENS) first followed by RACES/ARES primary repeater.

Macro enabled to operate after every transmission.

No check-ins will be taken. A short fuse generally will expire before check-ins are completed. Only severe weather reports are taken. It is highly unlikely that a significant severe weather event will occur in a short fuse environment. However, there are exceptions, May 18, 2000. Which was an unusual event.

SUPPLEMENTALS

SEVERE WEATHER AWARENESS LEVEL

Weather Officer is to keep the duty officers up to date on the current situation.

Upon development of expected thunderstorm activity, weather officer will notify the duty officers every 60-90 minutes on the status of approaching weather. The purpose is to gain advanced time and allow officers to plan ahead for the approaching weather.

SEVERE WEATHER ADVISORY LEVEL

Weather Officer will notify duty officers as to the approximate arrival time of thunderstorm activity.

SEVERE WEATHER WATCH LEVEL

Position of the Severe Weather Watch box can tell you the approximate time of severe weather arrival.

Generally, the back half of watch area will receive the suspected weather within 3 hours and the watch will generally clear early. In the front part of the watch area, suspected weather would generally not arrive for about 2 hours after issuance of the watch. The watch will likely last until expiration.

The further back you are in the watch area, the earlier the thunderstorms will arrive and the faster you will clear the watch area. The closer you are to front of the watch box, the longer it will take for the thunderstorms to arrive.

Keep in mind, this is only a guideline. Severe Weather can occur at anytime in or around a watch area. Being in the front half of the watch area is generally favorable. It allows more preparation time.

Incident Commander should have general weather and radar reports issued over the RACES primary repeater every 30 minutes unless, any newer developments are detected.

SEVERE WEATHER WARNING LEVEL

Incident Commander should have radar and updates on thunderstorms issued over the RACES/ARES primary repeater as often as necessary.

SEVERE WEATHER REPORTING CRITERIA

It is important the net control operator make clear as to the severe weather reporting criteria during net operation.

Losing control of a directed net can occur without the net operator realizing it.

One report outside the reporting criteria guidelines will encourage other similar reports.

Below is a list of Severe Weather Reporting Guidelines in a directed net;

WINDS IN EXCESS OF 50 MPH

Measured or estimated

One way to get an idea of wind speed is to estimate the average length of a downed branch or limb.

Example: You witness a 25 foot branch or limb down on your property, however, most of the other branches are just 10 to 12 feet. Chances are the 25-foot branch was weak and just fell in the wind. Take the 12 footers as your average. If you add the length to 40 and you have the estimated wind, **52-MPH. Report 50 MPH**

Example: You have had strong thunderstorm winds and many branches and limbs are down. Several limbs of 30-foot length are observed along with an array of 20-foot sections. Since the 20 footers seem to dominate, take the 20 and add to 40 and you have estimated winds, **60 MPH**.
Report 60 MPH

If numerous radio reports contain winds in excess of 60 mph, safety is of utmost importance. Shelter should be your primary concern and reports of damage can be after the event, not during the event.

One thing to keep in mind, if precipitation has been far above average during the previous month, it will affect the roots structures of many trees making it easier to blow down. It will give a false reading in your estimates.

Once enough reports of 50 MPH are received, change criteria to 58 MPH

All other reports will be taken after the directed net has ended. These reports are needed by the NWS for research. May 18th, 2000 is a prime example. While over 800 trees were blown down in Highland Park, this led people to believe there was either a tornado or winds over 100 MPH. In fact, heavy rains the previous two months were more responsible for the damage than the wind. Several measured winds speed in the area were actually in the 70-85 MPH category.

HAIL

Hail 0.50" in diameter or larger. Report the actual size. Measure it. Do it only when safe. Also, report hail that covers the ground regardless of size. Do not report it as moderate hail or light hail etc. Reporting hail with these attachments calls for too much guessing by net control.

All other hail reports will be taken after the directed net is complete. These reports are need by the NWS for research. These reports can also be sent via the weather observation link on the RACES web page.

FLOODING

This is always a tricky one. Flood reports should be limited to roads or underpasses that become impassable. If it's raining hard, everyone already knows there will be water everywhere. Restrict reports to roads that are not normally covered by water.

Rainfall rates can also be used as reporting criteria for flooding. Below are the thresholds;

1.50" in one hour
1.00" in 30 minutes
0.50" in 10 minutes
1.00" Total Event

These thresholds are variable depending on soil moisture content and will be detailed upon a directed net.

This information can be obtained from;

<http://www.earthsat.com/wx/flooding/floodthreat.html>

LIGHTNING

Reporting of lightning should follow the criteria below;

Frequent - 8+ flashes/15 seconds

Continuous - 15+ flashes/15 seconds

Once enough reports of lightning are taken, end lightning report.

It is important to note that the number of flashes reported is for a single storm not the sum of multiple storms.

WALL CLOUDS

All wall clouds rotating or not, should be reported.

It is important to note that wall clouds are in the rear of a thunderstorm.

They should not be confused with a shelf or roll cloud which occurs on the front of a thunderstorm. These events are caused by thunderstorm flow. New research also indicates that some tornado development can occur on the northern edge of bow echoes. See Storm Prediction Center for description of bow echoes.

FUNNEL CLOUDS OR TORNADOES

A funnel cloud is aloft not touching the ground. If a funnel extends at least half way down and you can't see the ground, assume that it is on the ground and report it as a tornado. Make sure that the report indicates exactly that. If you see a funnel or rotating wall cloud, check the ground below if possible. If debris is seen, report as a tornado with no condensation cloud yet formed. Due **NOT** report tornadoes on the ground in reference to any F-Scale. F-Scale cannot be determined by looking at an active tornado.

DAMAGE

Reporting criteria for damage reports;

Any tree damage that exceeds branch or limb length of 10 feet.

Damage due to hail.

Damage to buildings of any kind due to wind, hail or tornado.

Note: Due not report damage due to tornado or strong winds as any F-Scale.

Since most of us due not have the training in this area, false reports could occur.

SPOTTER GUIDE

Upon the declaration of an active net, spotters will report their position by town and nearest main intersection. In the future, a grid coordinate system may be used.

Spotters are to report to net control if they move their position or need to check out.

It is important to note, contact with net control first, insures the safety of all spotters.

When reporting severe weather, spotters are to abide by the strict guidelines of severe weather reporting unless changes are designated by net control.

Spotters should call net control by identifying themselves by call and then the type of severe weather they are reporting.

(e.g.) N9VID - Hail

When severe weather reaches extreme levels, mobile spotters are to seek safe shelter.

Criteria for safe harbor are listed below. Do not expect net control to tell you to seek safe shelter, as conditions may not allow the luxury.

Hail larger than 1.50 inches.

Winds greater than 74 mph.

Remember to anticipate these conditions. Don't wait until they are upon you. Listen to other reports and take the necessary precautions.

If you cannot seek safety, place your vehicle with the front toward the wind and go to the back seat. Also, it is important to keep as much distance between your vehicle and trees or buildings that are in the direction of the wind. It is safer to face a 75-mph wind coming across an open field than to be hit by tree or building debris.

In the event of severe lightning event, do not leave your vehicle. The only time this should be done is in winds greater than hurricane force or the possibility of a tornado.

Do not cross-flooded roads, unless you are familiar with that road and know how deep the water is. In the event of rapidly moving water, do not cross roads under any conditions.

Even roads you are familiar with can be washed away or you vehicle can be swept away.

In the event you are trapped by an approaching tornado, do not try and outrun it. Leave your vehicle and find a ditch or depression to lay down in. **DO NOT** seek shelter under an overpass.

In the event of a tornado at your location, be cautious about debris and downed power lines. Do not enter heavily damaged areas unless an emergency rescue is necessary.

WATCH LEVEL CRITERIA

The Storm Prediction Center always conveys percentages along with the severity of severe weather expected.

We receive those percentages via our Accuweather pagers.

In order to convey this assessment, there are three conditions of watches developed in accordance with the SPC criteria.

This will help convey information to our members and those listening without having to read the percentages outright.

SEVERE THUNDERSTORM WATCH --- CATAGORY 1

Hail 0.75 - 1.50" diameter and/or
Thunderstorm wind gusts 58-74 MPH

SEVERE THUNDERSTORM WATCH --- CATAGORY 2

Hail 1.50 - 2.50" diameter and/or
Thunderstorm wind gusts 75-92 MPH

SEVERE THUNDERSTORM WATCH --- CATAGORY 3

Hail 2.50" or larger in diameter
Thunderstorm wind gust in excess of 92 MPH

TORNADO WATCH --- CATAGORY 1

F0 - F1 Tornadoes Possible

TORNADO WATCH --- CATAGORY 2

F2 - F3 Tornadoes possible

TORNADO WATCH --- CATAGORY 3

F4 - F5 Tornadoes possible

Under a Severe Thunderstorm Watch, only the severe thunderstorm criteria is used.
Under a Tornado Watch, only tornado watch criteria are used. There is no overlap.

SPC PERCENTAGE FORECASTS

The SPC issues thunderstorm outlooks four times a day, present day, two times for day two and once a day for day three.

In addition, the percentage of possibilities for each of the severe weather criteria is reported.

The percentages are based on the likely hood that severe weather will occur within a center point and a 25-mile radius around that point. It does not indicate the likelihood of a severe weather warning.

Most percentages are based on the following;

Likelihood of hail 0.75 – 1.50” diameter and thunderstorm wind gusts 58-74 mph.

Tornadoes F0 - F1

In addition, if thunderstorm wind gusts 75 mph or greater and hail larger than 1.50” have a 10% chance, additional probabilities are given. It is also used when F2 or larger tornadoes are possible.

These situations generally have an additional notice of PDS (Particularly Dangerous Situation).

The mesoscale discussion itself will further tweak the percentages.

This is a simple explanation. Further in depth information is available at the Storm Prediction WebPages.

Highest probability so far noticed is 45% for standard outlook and 20% for PDS outlooks.

In addition, the Storm Prediction Center now issues probabilities of severe weather in an active severe weather watch. Information can be obtained by visiting the Storm Prediction Center web page.

PAGING

With the allocation of SAME NOAA radio receivers, paging has taken on a new importance. Below is a priority list of paging standards;

Skywarn - Only used when a warning or watch for Lake County is activated.
RACES/ARES pager (not to be confused with RACES/ARES group call) - Used when priority weather information needs to be passed on to members that have not been issued by Accuweather.

The National Weather Service has reformatted some transmission, therefore, Hazardous Weather Outlooks that were earlier given at 8 and Noon, are discontinued. Accuweather paging has, so far, been unable to solve the problem of transmission.

USING ID TO UPDATE WATCHES AND WARNINGS

There has been some discussion about the confusion or partially missed messages during net operations. Many times operators do not hear the entire message, therefore, asking it to be repeated. To avoid this, the use of a phonetic ID is a helpful choice. During any severe weather watches or warnings whether winter or summer, the use of an ID will allow other operators to know whether new information has been broadcast.

Beginning with Alpha, each new piece of info released over the air will have an ID. This will make it easier for operators at the other end to miss most of a message and know whether it is new or old.

WHEN TO HAVE A DIRECTED WEATHER NET

This has always been a controversial decision. In an effort to have some leeway in the decision as whether or not current conditions require a net, a hard fast rule will not be used. However, some form of guideline is needed.

An automatic net just because a collar county warning has been issued is not necessarily required. An example is a severe thunderstorm warning in McHenry county with thunderstorms moving due north.

The IC will use a general guideline to issue directed weather nets. In the event any thunderstorms involved in a warning scenario pass within 10 miles of a county border, a directed net will be declared. It is the sole decision of the IC as to whether thunderstorms will pass within 10 miles. Any discussion lasting longer than one minute or any indecision by the weather officer as to whether thunderstorms meet the criteria, a directed net will be declared. In other word, if your not sure, declare one.

POLYGON WARNING AREAS

The addition of polygon warning areas by the NWS has helped in modifying our quad reporting network. The NWS now gives an outline of the areas directly affected by a specific warning.

This allows RACES/AREAS to issue net activations not only for the entire county but for only portions of the county when needed.

FUTURE REVISIONS

As time goes on, future revisions on phase one will continue and be added to this SOP.

This, phase one, will be in effect no later than January 1st, 2002 and continue indefinitely.

Phase 2 will begin in the fall of 2006 with the addition of winter weather activities.

Additional phases will be added to the SOP but will in no way terminate the original document.

Some examples of additional planning including hopeful implementation dates;

1. Automated watch and warnings broadcast over RACES/ARES repeater. Fall 2006
2. Additional mobile spotters. Fall 2006
3. Re-design of EOC RACES operations. Ongoing
4. Resource managers who will be responsible for keeping logs of all severe weather nets, documentation, video, audio and the number of check-ins on weekly nets. It will also be the job of the resource manager to file and collate all events for later access. In Progress
5. Training of personnel to operate directed nets. Summer 2006
6. A grid coordination system based on Rand-McNally map grids. Winter 2006-7
7. Rebroadcast of actual NWS watches and warnings. Fall 2006
8. Winter weather operations. Spring 2007
9. Actual video and audio of EOC operations during directed nets to be used to training as well as criteria for operators. Fall 2006
10. Additional spotter training over and above NWS and Advanced Spotter Training which will included a severe weather training class in all aspects of severe weather. Winter 2006-7
11. Resource shifting of spotters to different quad areas. Spring 2006
12. Additional UHF for broadcast of watches and warnings. Fall 2006

As with all volunteer organizations, active participation is needed to complete all phases.

However, I have checked other web sites and asked about various other Skywarn programs and we indeed are gaining ground..

This SOP and upgrades to our EOC operations will attempt to reverse this trend. Everyone's help is needed. Great volunteer networks are the result of great volunteers. I'm convinced that we are one of them.

Bruce/N9VID

