INSTRUCTIONS FOR THE PREPARATION OF CRANE INFORMATION FORM FOR UNDERRUNNING (SINGLE GIDER) CRANE(S)

(NCC Form 08-003, June 2008)

Section 1. Enter the appropriate points of contact's names, activity, email, and phone numbers.

Section 2.

2A. Enter the activity where the cranes will be installed. (UIC = Unit Identification Code, or DODAAC = Department of Defense Activity Address Code for non-Navy installations)

2B. Enter the information for the building location where the cranes will be located.

2C. Enter desired date for the crane to be installed and operational.

Section 3.

3A. Enter crane hoist/trolley capacity in pounds. *As a rule of thumb, the hoist should be sized such that the heaviest anticipated lift is at 80% of hoist capacity. This will minimize the number of critical lifts (see NAVFAC P-307 10.4.1).*

3B. Indicate if more than one trolley is required on the same bridge or runway, if required enter the capacity for each trolley. *Multiple trolleys on the same bridge are used for manipulation of lifted loads, or for lifts using equalizing beams in low headroom installation.*

3C. Indicate if there are any cranes on the same runway as the crane to be installed or if there are any plans to remove or add additional cranes in the future.

Section 4.

4A. Indicate the number of identical cranes required. *If additional cranes are needed that are not identical a separate crane information form should be prepared.*

4B. Indicate the preferred hoist type and hoist power source. *The hoists are the most critical assemblies of any crane - they raise, lower, hold, and stop moving loads – and warrant the most attention to their design and quality of workmanship. Depending on the application, the hoists may be built-up to the precise specification requirements or they may be standard commercial units designed to a particular service or duty class. The built-up hoists are usually electric motor driven and with wire rope reeving. The standard commercial packaged hoists may be electrically, air, or manually powered and may use either wire rope or chain reeving.*

4C. Indicate the preferred bridge type and bridge power source.

- *The bridge power source only needs to be indicated if selecting a bridge crane. Both the jib and monorail cranes are of a fixed type bridge.*
- *Underunning bridge cranes or "underhung" cranes always feature an underrunning hoist/trolley unit or a trolley with a separate hoist; however, the bridge end trucks may be overrunning (on runway rails) or underrunning (on the lower flanges of runway beams). The underrunning runway beams are secured to the roof support structure of the building.*
- *Jib cranes have a restricted area of hook coverage but are easy to install in any location that requires light hoisting service. The booms on these cranes are always in the form of a single-web girder with an underrunning hoist/trolley unit. Because of the moment imposed on the boom and the support structure, the rated capacity of these cranes is usually limited to 5 tons*.
- *Monorail layouts may be straight, with curves, open or closed loops of patented track. Standard track switches, both electrically and manually operated, are available to permit hoist/trolley units to transfer between adjacent sections of the monorail layout.*

4D. Indicate the preferred trolley power source.

Section 5.

5A. Indicate if the crane will be General Purpose Service (GPS) or Special Purpose Service (SPS). *Cranes in "special purpose service" (SPS) support various lifting operations associated with the servicing of nuclear reactors and related components aboard vessels and in shore facilities. Any crane not designated as an SPS crane is a GPS crane.*

5B. Indicate the CMAA/ASME HST class of service for the cranes, if the CMAA/ASME HST class is unknown indicate the estimated main hoist lifts. *Navy Crane Center policy is to require all underrunning cranes to be a CMAA Class "C" / ASME HST 3 or better.*

5C. Provide information on the lifting operations that the crane will be performing. *This includes a brief description of the normal day to day operation that the crane will perform and any anticipated specialized lifts that the crane may make. Be as specific as possible about what item will be lifted, how high, how far it will be carried, and how often the lift will be performed.*

5D-1. Enter any classification that may be applicable to the cranes. *A hazardous environment is defined as an environment where fire or explosion hazards exist due to presence of flammable vapors, liquids, gases, dusts, or fibers in combustible or flammable concentrations.*

5D-2. If the crane is classified as Hazardous, provide the National Electric Code (NEC) Class, Division and Group, if known. Additionally, identify if the crane will be performing either Hot (Molten) Metal Service or Ordinance/Explosive Handling Service.

- *Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class II locations are those that are hazardous because of the presence of combustible dust. Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings, but in which such fibers are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures.*
- *Division 1 is usually when hazardous material is present during normal operating conditions. Division 2 is usually when an abnormal condition would cause a hazardous material to be present.*
- *The NEC Group is based on the chemical properties of the hazardous materials present.*
- *See NEC Code Article 500 for further guidance on hazardous locations.*
- *Hot Metal Service and Ordinance/Explosive Handling service are specialized hazardous environments, which require additional safety requirements in the design of cranes.*

5D-3. Indicate if captivation is required and provide a brief explanation of the requirements for the captivation. *Captivation is necessary on fasteners or other material where foreign material exclusion areas prevent these materials. Typically captivation provisions are necessary when cranes are used to lift radioactive materials or major reactor components over open reactor components.*

5D-4. Indicate if containment or oil/grease tight gear is required and provide a brief explanation of the requirements. *Containment or use of oil/grease tight gear is usually required where foreign material exclusion areas prevent these materials, however, other areas exist where dripping grease or oil will create hazards or impact the work area requiring drip pans.*

5D-5. Indicate if the crane operating area is indoors, even if not climate controlled, or outdoors where wind or weather become design factors.

5D-6. Indicate the high and low ambient temperature range where the crane will be operating. *It is important to accurately determine the operating temperature range of the crane to determine appropriate derating factors. Temperatures below 14 degrees F and above 104 degrees F may require additional heating or cooling for panels containing electronic crane drives.*

5D-7. Indicate any additional considerations about the crane's operating environment that may be helpful in crane design.

Section 6. This section does not need to be completed if only manual controls will be used on the crane.

6A-1. Indicate what the primary mode of operation for the crane.

- *The standard location for controls on an underruning crane are on a suspended pendent pushbutton station near the floor level, or at a radio controlled remote control station.*
- *Infrared controls are a means of controlling a crane from a remote control station, but are not as common as radio controls due to the fact that the controls will not work when the transmitter is directed away from the crane or is not in line of sight.*
- *Wall controls are uncommon and are usually only used in specialized situations.*

6A-2. Indicate if secondary controls are required and if so indicate the type required. *Secondary controls are useful if the operator's position changes frequently from floor level to an elevated platform. Secondary controls are not common on underrunning cranes.*

6B-1. If pendant controls were selected in 6A, indicate which options are required for the pendant controls.
- *Lockable pendants will have a keyswitch that will allow the crane to be locked out from the pendant station.*
- *A detachable pendant is usually used when the pendant controls are a secondary mode of operation. This allows the pendant to be completely detached from the crane when the pendant is not being used.*
- *A retractable pendant allows the pendant to retract out of the way when not in use.*
- *Indicator lights such as power on, power available, and fault indications can be located on the pendant. These lights may be located on the pendant, on the crane bridge (See Section 8E.), or in both locations. Location of these lights on the pendant make the pendant controller bulkier and require a bigger pendant cable, but may require less maintenance than indicator lights mounted on the bridge.*

6B-2. If pendant controls were selected in 6A, indicate how the pendant controls will move. *For monorail and jib cranes the standard design is to have the pendant control mounted from the trolley moves as the trolley of the crane moves requiring the operator to move with the load. For underrunning bridge crane the standard design is to have the pendant move on it's own independent messenger track.*

6C-1. If radio controls were selected in 6A, indicate which type of controls would be preferred for the radio controls. *Joystick type radio controls are the standard design and are similar to cab operated cranes, this method of radio controls usually requires a bigger transmitter and a harness. Pushbutton type radio controls are similar to a pendant station; this method of radio controls reduces the amount of functions that can be placed on the transmitter but provides a lighter transmitter.*

6C-2. If radio controls were selected in 6A, indicate the frequency range for the radio controls (if known).
- *Most activities choose a licensed portable transmitter since it is less susceptible to interference. The range of licensed portable transmitters operating on*

Government exclusive and Government shared frequencies is less than 1000 feet. For licensed radio control systems, Form DD1494, "Application for Equipment Frequency Allocation" must be approved by the Naval Electromagnetic Spectrum Center (NAVEMSCEN), prior to obtaining a specific frequency from the frequency coordinator. The frequency allocation must be maintained throughout the life of the equipment by resubmitting requesting documentation on a periodic basis.

- *Some activities choose a non-licensed portable transmitter due to time constraints in obtaining a license and the dearth of frequencies available in the Government exclusive bands. The range of non-licensed portable transmitters operating in non-Government exclusive frequencies is at least 200 feet. Form DD1494, frequency allocation and assignments for non-licensed systems must be submitted to NAVEMSCEN for information..*

6D. Indicate any additional crane control considerations that may be helpful in crane design such as existing building platforms, building interferences, or unusual operating positions.

Section 7.

7A. Indicate the max and min speeds, in feet per minute, of the Bridge, Trolley, and Main Hoist, in the corresponding blanks.

- *Maximum speeds should be based on crane capacity, bridge and trolley spans, and the type of crane operations that will be performed. Below is a guide for selecting maximum speed in feet per minute based on the Crane Manufacturer's Association of America (CMAA) #74 specifications. Further guidance on speed selection may be gotten from CMAA #74 or by contacting the Navy Crane Center.*

Guidance for Speeds in Feet Per Minute (fpm)

Crane Capacity	Hoist			Trolley			Bridge		
	Slow	Medium	Fast	Slow	Medium	Fast	Slow	Medium	Fast
3 tons	14	35	45	50	80	125	50	115	175
5 tons	14	27	40	50	80	125	50	115	175
7.5 tons	13	27	38	50	80	125	50	115	175
10 tons	13	21	35	50	80	125	50	115	175
15 tons	13	19	31	50	80	125	50	115	175
20 tons	10	17	30	50	80	125	50	115	175
25 tons	8	14	29	50	80	125	50	115	175
30 tons	7	14	28	50	80	125	50	115	150

- *Minimum crane speeds should be selected based on the type of crane operations being performed. Minimum speeds at a ratio greater than 100:1 of the maximum speed on the bridge and trolley function require multiple VFD drives and become a much more complex control system. Default minimum speeds for normal operations are on a ratio of 50:1 of the maximum speeds (Example: If the maximum speed is 100 fpm, the minimum speed would be 2 fpm).*

7B. Indicate if a slow speed selector switch is required for precise positioning. *The slow speed selector switch will normally reduce maximum speeds on all*

functions to 25% - 10% of the rated maximum speeds while the slow speed selector switch is on.

Section 8. This section does not need to be completed if electric controls are not used on the crane.

8A-1. Indicate who will be supplying the crane runway conductors. *Typically, the runway conductors are existing or will be provided by the crane contractor as part of the crane contract.*

8A-2. Indicate if there is a preference for runway electrification. *Typically, the runway electrification for all underrunning cranes except underrunning bridge cranes with long runway spans will be of the festoon types.*

8A-3. Provide information for the crane runway conductors if they are not going to be installed by the crane contractor.

8A-4. Indicate the voltage and current of the crane supply branch circuit. *Standard AC voltages for crane supplies are most always 480 volts. The rating of the fuses or circuit breaker feeding the crane runway conductors can be used as the supply current. If the crane runway overcurrent device has not been specified or will be provided as part of the crane contract, provide the VA rating of the transformer feeding the crane runway in order to determine the available current, contact NAVCRANECEN if further assistance is needed in determining the branch circuit ratings.*

8A-5. Describe the location of the existing electrical disconnect or circuit breaker with respect to the crane runway. *This can be done by providing a side of the runway (North, South, East, West) and an approximate location on the runway rail (For example: Disconnect is in the northeast corner approximately 30 ft. from the north wall)*

8B. Indicate the type of electrical controls desired for each of the crane's function.

- *Inverter controls provide less maintenance and better precision than other control types. Infinitely variable controls provide infinite speed points, this can be accomplished either by a control lever or by pushbuttons. Inverter controls that use speed points limit the number of different speeds available by the number of speed points selected.*
- *Two speed controls requires single or two speed squirrel cage motors controlled by contactors. Two speed controls requires more maintenance and provide less precision than inverter controls, but do not use any electronic based controls.*
- *If DC load sensitive, DC fixed speed points, or wound rotor motor control is required indicate type and select Other. These are not standard controls for new underrunning crane installations.*
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8C. Indicate if indicator lights should be located on the crane/bridge. *Indicator lights such as power on, power available, and fault indications can be located on the bridge if they are not located on the pendant controller. Lights may be located at both the operator's station and the bridge. See section 6B-1 for additional information of location of indicator lights.*

8D-1. If inverter controls with speed points was selected in 8B, indicate the number of speed points for each function. *Typically, there will be two to five speed points for each function. For push button controls, the more speed points the longer the push buttons..*

8D-2. Indicate if a data logger is required to record faults. *A data logger will record a predetermined amount of run commands, alarms, and faults such that they could be used at a future time to assist in troubleshooting.*

8E. Indicate if radio frequency interference suppression is required based on the crane's operating area. If significant radio frequency generation occurs in the area of the crane, this may be required for electronic crane controls.

Section 9.

9A-1. Indicate the level of overload protection necessary to prevent overloading the crane's capacity. *NAVYCRANECEN recommends an overload lockout, which will not allow the operator to lift a weigh in excess of the crane's capacity. Typically overload lockouts are bypassable by a switch to allow for load testing of the crane. An overload warning will not lockout the crane when an overload of the crane's capacity is experienced, but will notify the operator by a warning device.*

9A-2. If an overload warning or lockout was selected in 9A-1 indicate the percentage of full capacity where the overload protection should be set. *NAVYCRANECEN recommends setting the overload protection at 100% of capacity or less, if the overload protection is by means of a lockout this will prevent an overload accident as defined by the NAVFAC P-307, but may activate with as little as 80% capacity load on the hoist due to acceleration forces.*

9B. Indicate if anti-collision interlocks are required. *Anti-collision interlocks are used to slow down or stop a crane before colliding with another crane or object. Typically they require a transmitter to be placed on the crane and a reflective target to be placed on the crane or object that the crane could come into contact with. Bumpers, which are a standard item mounted on the bridge and trolley, are typically sufficient except for sensitive loads.*

9C. Indicate which warning devices are required. *At least one of the warning devices listed is required for all remote controlled cranes. More than one device can be selected. NAVCRANECEN recommends having at least one warning device on all underrunning bridge cranes.*

9D-1. Indicate if travel limits are required. *Travel limits are used to stop or slow down either the trolley or bridge function at a certain point on the rail. Travel limits are not used on typical OET crane installations.*

9D-2. Indicate if the crane will cross over to another runway or the trolley will cross over to another crane bridge. *This is not typical, but may be required on some underrunning monorail cranes.*

9D-3. Indicate if the crane will pass through doors.

Section 10.

10A. Indicate if there is any special paint requirements, such as primer only, and provide a brief explanation.

10B. Indicate if the government or the crane contractor will provide the test weights and rigging gear for the acceptance of the crane. *Crane contractors can provide rigging gear and test weights, but activities should try to provide these services if possible to reduce the price of the crane contract and to ensure that sufficient weight is available locally to support periodic load testing.*

10C. Indicate how many hard copies of manuals and drawings are required. *Cranes will be supplied with electronic copies of all drawings and manuals.*

10D. Indicate if training for the crane is required. *Typically operational and maintenance training for the crane is provided as part of the contract, but there are instances where training is not needed and thus could reduce the price of the contract.*

10E. Provide any additional information or expand on any answers previously given that would be beneficial in developing the specifications for the crane.

INSTRUCTIONS FOR THE PREPARATION OF UNDERHUNG OVER HEAD CRANE CLEARANCE AND BUILDING WORKSHEETS

The worksheets upon being filled out provide the supplemental information for the crane information form. It is necessary to re-enter the information that may have been provided to the crane information form. Information available in Metric shall be converted to the US standard unit before being entered to the worksheets. Both worksheets can be filled manually or electronically.

Mandatory information that requires value input shall be marked with **(M)** designation in this instruction.

Conditionally mandatory information that only be required value input in contingent to other feature(s) of the crane or the building are marked with **(CM)** designation.

Supporting information fields are optional, and they are to be filled with readily available information.

Turn on the "Highlight Field" feature of Adobe Acrobat when filling the sketch form electronically to identify all fields.

A. Overhead Crane Clearance Worksheet

Compass Direction

Indicate the compass direction associated with the plan view of the crane. When the actual location of the building falls between two directions, select the best direction. Select only the upward direction when filling electronically; the other directions are filled automatically.

In the Area above Plan View

Crane and Runway System: Provide information about the crane and the runway system by selecting the appropriate "NEW" or EXISTING" buttons. **(M)**

Elevation/View X-X

1. ***A:*** Distance between the centerlines of the crane runway rails. Enter value in feet-inches. **(M)**
2. ***B*** (Lift)***:*** Minimum distance from the operating floor to the saddle of the main hook when it is at the highest point. Enter value in feet-inches or round up to the next 1 foot. **(M)**
3. ***C:*** Distance form the top of the crane runway to the lowest obstruction in the building such as roof truss, light sprinkler etc. Enter value in feet-inches. **(M)**
4. ***D:*** Distance form the operating floor to the top of the crane runway. Enter value in feet-inches. **(M)**
5. ***E and F:*** The maximum distance from center of the saddle of the hook to the centerline of the crane runway when the trolley parks against the stops. Enter value in "feet-inches". **(M)**
6. ***G:*** Perpendicular distance between the center of the saddle of the hook to the attach point of the pendant controller cable on the hoist/trolly. Disregard this

dimension if not critical or when the pendant controller is on independent track. Enter value in feet-inches.

7. ***H:*** The height reference for the pendant push button station relevant for crane with pendant control push button only. Enter value in feet.
8. ***J and I:*** Pre-filled values J and I are the minimum requirement for top and side clearances respectively from crane structure to building stationary objects.
9. ***K:*** Measurement from the centerline of crane runway rail to the first obstruction on the side of the building. Value for K can be used to determine the overall length of the crane while maintaining minimum requirement of dimension I. Provide only the smallest value for K if available.
10. ***L, M, and N:*** When permanent obstruction exist within crane operating envelope, values for dimension L, M, and N are required. **(CM)**
11. ***O:*** If a pit exists within the crane service area and crane operation requires the hook to be lowered to a pit value for dimension P is required. **(CM)**
12. ***P:*** In the case of existing crane, provide value for crane wheel spacing P (if available) for evaluation of the wheel load.
13. Enter all available information or desired feature about the runway system for either top running or under running crane.
14. ***Notes:*** Provide note(s) for any clarification or additional information.

B. Overhead Crane Building Worksheet

Compass Direction

Indicate the compass direction identical to that on the clearance worksheet. Select only the upward direction when filling electronically; the other directions are filled automatically.

Plan View

1. ***Main Power Disconnect:*** Select the approximate location for the main power disconnect to the crane if known.
2. ***AA:*** Enter the value for crane runway length in feet. This value is mandatory for new crane when contractor has to supply the runway conductor system. **(M)**
3. ***BB, CC and DD:*** Enter the desired values in feet-inches for crane hook approach from the ends of the runway when crane parks against its stops.
4. ***EE:*** Enter the value for EE when the crane main power disconnect is located significantly away from the end of the runway.
5. ***FF and GG:*** When permanent obstruction exists within crane operating envelope, dimensions FF and GG are required. **(CM)**
6. Enter all information under “Crane Electrification” **(M)**
7. Enter all available information for “Existing Runway Conductor Configuration”
8. ***Notes:*** Provide note(s) for any clarification or additional information.