



SV 001 Substation Bird and Animal Protection—General Information

1. Scope

This standard provides information on the protection of birds of prey (raptors), various other protected birds, and animals, from electrocution and associated outages resulting from contact with electrical equipment and facilities within substations. The company's [Substation Bird Protection Policy](http://idoc.pacificorp.us/content/dam/intranet/doc/e/environmental_resources/rmpes/avian/Avian_Protection_Plan_Policy_Substation.pdf) (posted to intranet site http://idoc.pacificorp.us/content/dam/intranet/doc/e/environmental_resources/rmpes/avian/Avian_Protection_Plan_Policy_Substation.pdf) states that new substations will comply with company avian-safe substation design standards. Substations that pose a high risk of bird or animal caused outages or protected bird mortalities should be retrofitted or modified when feasible. Modifications should be in accordance with the company's Bird and Animal Protection Plan (APP) policies and procedures and company avian-safe substation design standards.

2. Background and Regulations

Governmental agencies, conservation organizations, and the general public are concerned about avian safety. Industrial customers and the public expect reliable electric service. These concerns and expectations have generated great public demand for both high service reliability and protection of avian populations and their habitats.

The company's APPs use proactive, reactive, and preventative measures to reduce bird mortalities and bird-related outages. Three federal laws in the U.S. protect almost all avian species and prohibit "taking," or killing, any of them. The Migratory Bird Treaty Act (MBTA) of 1916 protects over 1,000 species of native North American migratory birds, including crows, ravens, magpies, jays, woodpeckers, songbirds, gulls, cranes, pelicans, herons, waterfowl, vultures, hawks, eagles, and owls. The Bald and Golden Eagle Protection Act of 1940 provides additional protection to both bald and golden eagles. The Endangered Species Act (ESA) of 1973 applies to species that are federally listed as threatened or endangered. The MBTA states:

"Unless and except as permitted by regulations... it shall be unlawful at any time, by any means, or in any manner to pursue, hunt, take, capture, kill... possess, offer for sale, sell... purchase... ship, export, import... transport or cause to be transported... any migratory bird, any part, nest, or eggs of any such bird, or any product... composed in whole or in part, of any such bird or any part, nest, or egg thereof..."

In other words, it is illegal to kill or possess any protected bird, including their eggs or young. Dead birds should not be transported without specific authorization from the U.S. Fish and Wildlife Service (USFWS). Other agencies, such as state fish and wildlife agencies, cannot provide this authorization. The collection,

possession, and transfer of bird nests is also illegal under the MBTA. The destruction of nests that do not contain eggs or nestlings (inactive nests) is not illegal; this, however, **does not** apply to eagles, herons, or species listed under ESA, whose active (nests with eggs and or young) and inactive nests may not be destroyed. The USFWS may issue permits for the removal of active nests in cases of imminent danger, e.g. immediate fire, safety, or bird electrocution risks. In such cases, employees should contact the T&D environmental services department for assistance and guidance.

3. Bird/Animal Electrocutions

Birds and other animals can be electrocuted by simultaneously contacting energized and/or grounded structures, conductors, hardware, or equipment. Electrocutions may occur due to a combination of biological and electrical design factors. Biological factors such as habitat, bird populations, season, nesting substrates and prey availability influence birds' use of poles and substations.

The electrical design factor most crucial to avian electrocution on structures is the physical separation between energized and/or grounded conductors, hardware, or equipment that can be bridged by birds. As a general rule, bird electrocution can occur on structures with the following:

1. Phase conductors or energized equipment separated by less than the wrist-to-wrist distance or height (flesh-to-flesh distance) of a bird that is landing, perching, or taking off.
2. Grounded hardware separated from any energized phase conductor by less than the wrist-to-wrist distance or height (flesh-to-flesh distance) of a bird.

Because dry feathers provide insulation, birds must typically contact electrical equipment with fleshy parts that are conductive for electrocution to occur. Fleshy parts include the feet, head, and the wrists from which the primary feathers originate. For a large golden eagle with a 90" wingspan, the distance from the fleshy tip of one wrist to the tip of the other can measure up to 42"; the height (head to foot) of an eagle can reach up to 28". The industry recommended guideline for bird and animal protection listed in *Suggested Practices for Avian Protection On Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee 2006), used by the company in its transmission and distribution line design standards, is 60" of horizontal separation and 40" of vertical separation between energized and/or grounded parts (based on the dimensions of an eagle).

Due to the low risk of eagle electrocutions in substations, the company has adopted avian-safe distances in substations of 46" of horizontal separation and 30" of vertical separation between energized and/or grounded parts, as described in the SV chapter of the substation standards. These dimensions are based on the measurements of the largest birds commonly observed in substations and are sufficient for the protection of birds such as hawks, owls, ravens, and smaller birds. Covers and/or barriers should be installed to reduce the risk of bird and animal electrocution where there is less than 30" of vertical separation and/or less than 46" of horizontal/diagonal separation between potential points of contact at and near substation equipment and support structures. Phase-to-ground and phase-to-phase distances must be evaluated when determining the need for protection. The installation of cover-up material and barriers should not interfere with the proper operation, grounding and maintenance of substation equipment.

These standards should be applied for new construction and, where feasible, to existing substations where protected bird mortalities, bird-caused outages, or bird nests have occurred. Applying these standards will also minimize outages caused by animals and smaller, non-protected birds.

4. Reporting

Dead birds of protected species found on, near, or below company distribution and transmission facilities or substations must be reported in the Bird Mortality Tracking System (BMTS) on the company's intranet page. Eagles and threatened or endangered species must be reported to T&D environmental services immediately upon discovery. All birds, excluding eagles and threatened or endangered species, should be buried on-site. Endangered species within the company's service territory may include the California condor and the spotted owl. Check with environmental services for current endangered/threatened species listings and for assistance in species identification.

5. Avian-Safe Symbol

The company's transmission, distribution and substation avian-safe construction design standards are marked at the top of the first page of the applicable standard, with the symbol shown below in Figure 1.



Figure 1—The Company's Avian-Safe Symbol

6. New Construction and Maintenance

The company's bird and animal protection policy requires new substations comply with avian-safe substation design standards. When feasible, existing substations that pose a high risk of bird- or animal-caused outages, or where protected bird mortalities have occurred, should be retrofitted or modified. This may be done during outage response or when substation equipment is taken out of service for maintenance, repairs, or additions. For more information on retrofitting techniques and available materials, see the subsequent SV substation standards for avian-safe designs and modifications.

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