U.S. Department of Transportation
Federal Highway Administration

400 Seventh St., S.W.
Washington, DC 20590

April 2, 2007

In Reply Refer To:
HSSD/LS-60

Mr. John I. Vaughn
SECO Signal Equipment Co.
P.O. Box 78172
Shreveport, LA 71137-8172

Dear Mr. Vaughn:

Thank you for your mail correspondence of October 25, 2006 requesting the Federal Highway Administration's (FHWA) acceptance of your company's SECO-South safety system for use on the National Highway System (NHS). Accompanying your letter was a report on testing of your system conducted by the Texas Transportation Institute (TTI) and test videos. You requested that we find your device acceptable for use on the NHS under the provisions of the National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Requirements
Your system is intended to be used with various roadside devices such as sign and signal supports, luminaires, and vehicle detection devices. Sign and luminaire supports should meet the guidelines contained in the NCHRP Report 350. The FHWA Memorandum "ACTION: Identifying Acceptable Highway Safety Features" of July 25, 1997 provides further guidance on crash testing of sign and luminaire supports and the use of low speed pendulum tests as a surrogate for full scale crash testing.

Product description
Your company's SECO-South safety system is primarily designed to de-energize power supply circuits into a luminaire pole when forces are applied to a pole with magnitudes that move the pole from its foundation. Additionally, the safety system provides a voltage monitoring device that is connected to the load circuits. This device identifies the integrity of the electrical circuits (either AC or DC) and the level of voltage potential. Your company's SECO-South safety system is intended to be used with various roadside devices such as sign and signal supports, luminaires, and vehicle detection devices.

The system includes four key safety elements. The first key safety element is that the fuse assembly is located on the power side of a waterproof enclosure in an underground junction box. Second, the system uses a load cable that runs from the waterproof enclosure to the luminaire

pole. This load cable terminates in a splice segment that is connected to the luminaire pole cable. The splice segment is selected so that the displacement of the pole will separate the two cables at the splice segment and not tear the cables. Third, the system includes a trip mechanism that is located in the waterproof enclosure. The trip mechanism is activated by a separate trip cable that runs from the waterproof enclosure to the base of the luminaire. If the load cable and luminaire cable fail to separate from each other at the splice segment, then the trip mechanism will ensure that no power is running from the junction box to the luminaire cable. The fourth safety element is the indicator inside the junction box that displays whether or not electricity is flowing to the load cable.

Testing

Your company's SECO-South safety system was tested at TTI's outdoor pendulum testing facility. The pendulum bogie was built according to the specifications of the Federal Outdoor Impact Laboratory's (FOIL) pendulum. The frontal crush of the aluminum honeycomb nose of the bogie simulates the crush of an actual vehicle.

Two tests were conducted on your company's SECO-South safety system. One test was conducted on the small triangular slip base and another on the large frangible base to test the anticipated range of use. The two bases used in the pendulum tests have been tested previously and received the FHWA acceptance for tests 3-60 and 3-61. The tests were done to prove that your company's SECO-South safety system does not degrade the breakaway performance of these previously tested devices. The low speed pendulum tests are the critical tests as increased inertia of higher speed tests will likely activate SECO-South safety system more readily.

For the first test, the SECO-South safety system was installed with the triangular small sign support slip base to reflect the most severe test conditions and with the greatest potential for improper function of the system. The support was a 2.25 in (57.2 mm) inner diameter x 9.5 ft (2.89 m) steel pipe with a weight of 70 lb (31.8 kg). The slip base bolts and set screws were torqued to 60 ft-lb (8.3 kg-m). The slip base holes were oriented parallel with the sign panel. Attached to the support was a 3 ft x 3 ft x 5/8 in thick (914 mm x 914 mm x 16 mm) plywood sign panel weighing 18 lb (8.2 kg). Height to the bottom of the sign panel was 7 ft (2.14 m). The electrical cord was pulled through the top of the support and taped to the outside. The pendulum nose contacted the sign support at a height of 19.5 in (495 mm). The pendulum bogie impacted the sign support at an impact speed of 21.7 mph (34.9 km/h).

For the second test, the SECO-South safety system was installed in a transformer base with 4 in (101.6 mm) inner diameter x 13 ft (3.96 m) aluminum pipe support and weighed 72 lb (32.7 kg). No sign panel or luminaire was attached. The electrical cord followed through the top of the support and was taped to the outside of the support. The height of the pendulum nose as it contacted the sign support was 19.5 in. (495 mm). The pendulum bogie impacted the sign support at an impact speed of 21.6 mph (34.8 km/h).

Findings
In the first test, the triangular small sign support slip base separated from the base and the cable withdrew from the connection box after pulling the electrical switch to the off position. The electrical cord was cut at the top of the slip base. The slip base mechanism performed as intended and all occupant risk values were below the preferred limits.

In the second test, the pedestal separated from the base and the cable withdrew from the connection box after pulling the electrical switch to the off position and the electrical cord unplugged. The pedestal base broke off at the anchor bolts and all occupant risk values were below the preferred limits.

The results of testing met the FHWA requirements. The SECO-South safety system described above and shown in the enclosed drawings for reference is acceptable for use as test level 3 device on the NHS under the range of conditions tested, when proposed by a State.

Standard provisions
Please note the following standard provisions that apply to the FHWA letters of acceptance:

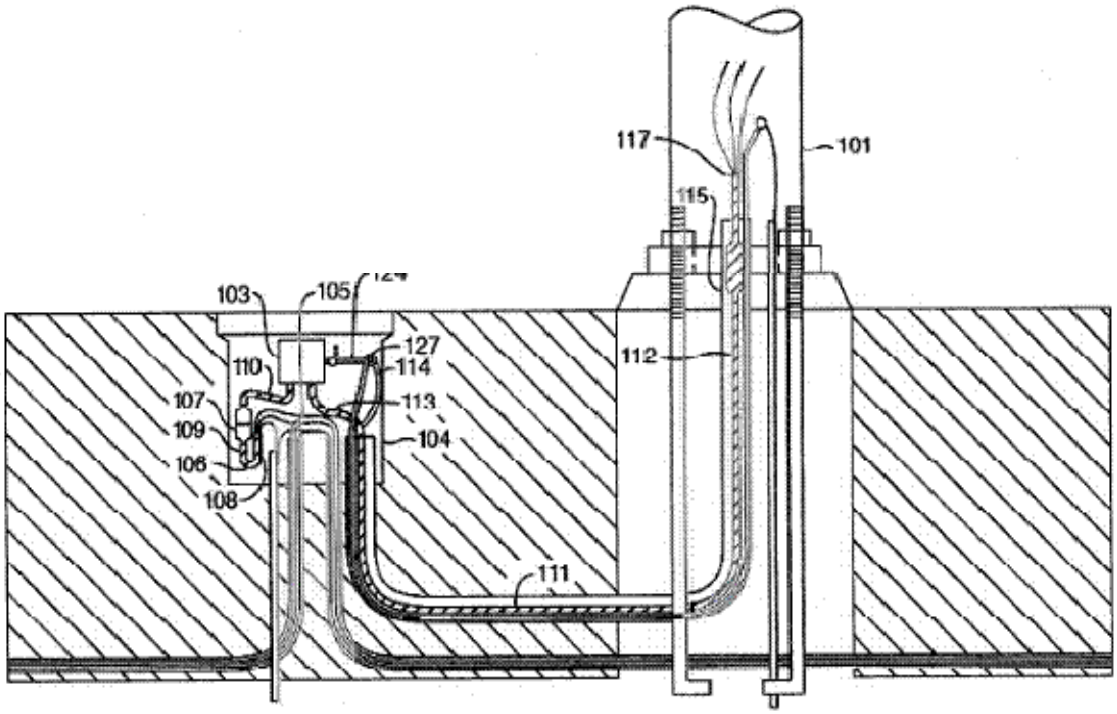
- This acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number LS-60, shall not be reproduced except in full. This letter, and the test documentation upon which this letter is based, is public information. All such letters and documentation may be reviewed at our office upon request.
- The SECO-South safety system is a patented product and considered proprietary. If proprietary devices are specified by a highway agency for use on Federal-aid projects, except exempt, non-NHS projects, they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.

- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,

John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

Enclosures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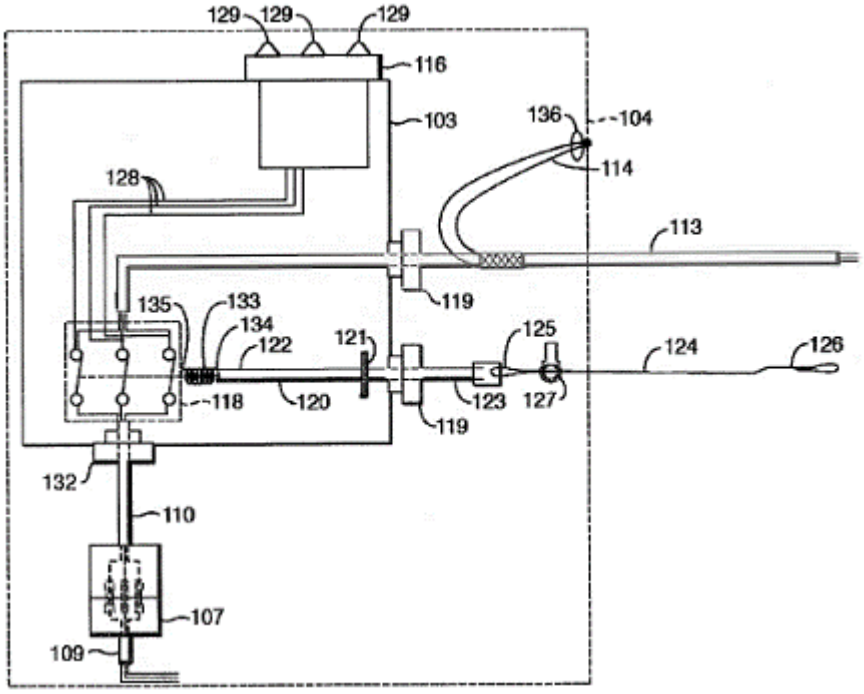
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Table D1. Summary of results for pendulum test 400001-SES P1.

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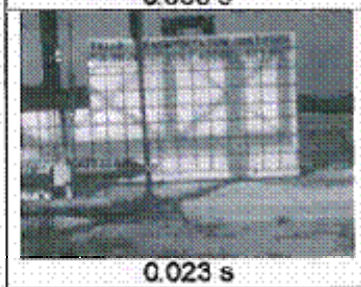

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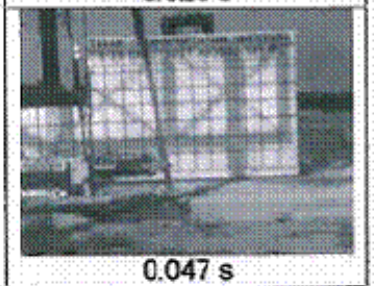

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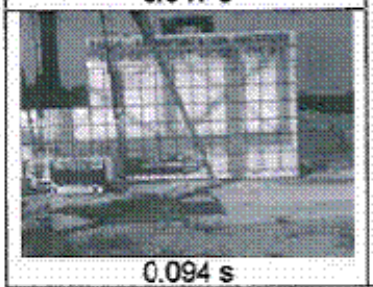

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General Information
Test Agency ..... Texas Transportation Institute
Test No. 400001-SES P1
Date 08-28-2006

Test Article
Type ..... Single Sign Support
Name ..... SECO-South safety system
Installation Height (m) ..... 2.1 m (7 ft)
Material of Key Element .....

Soil Type ..... Standard Soil

Test Vehicle
Type ..... Bogie
Designation ..... Pendulum
Test Inertia Mass ..... 839 kg

Impact Conditions
Speed ..... 34.9 km/h
Angle ..... 90 deg

Occupant Risk Values
Impact Velocity
Longtudinal direction ..... No contact
Ridedown Accelerations
Longtudinal direction ..... N/A
Maximum Change in Velocity ..... 2.46 ft/s (0.75 m/s)
Predicted High-Speed Change in Velocity ..... m/s

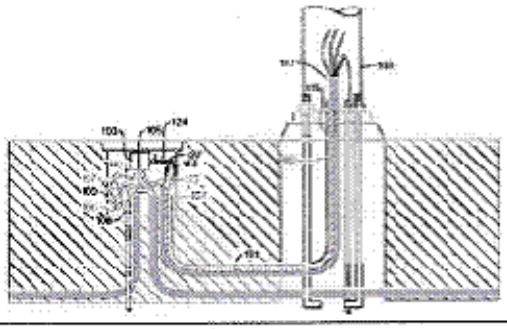

Table D2. Summary of results for pendulum test 400001-SES P2.

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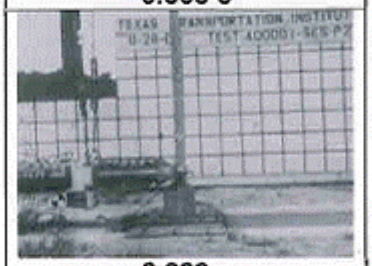

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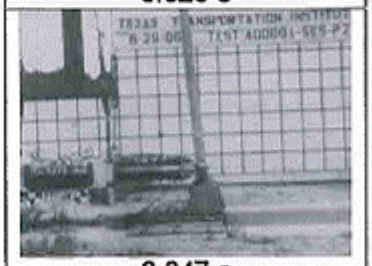

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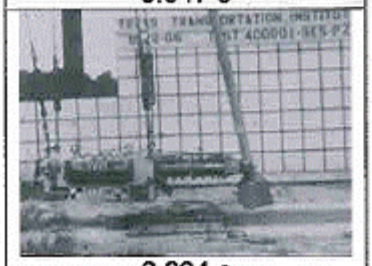

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General Information
Test Agency.....Texas Transportation Institute
Test No.....400001-SES P2
Date.....08-28-2006

Test Article
Type.....Single Sign Support
Name.....Sponsor's Sign Support
Installation Height (m).....2.1 m (7 ft)
Material of Key Element.....

Soil Type.....Standard Soil

Test Vehicle
Type.....Bogie
Designation.....Pendulum
Test Inertia Mass.....839 kg

Impact Conditions
Speed.....34.8 km/h
Angle.....90 deg

Occupant Risk Values
Impact Velocity
Longitudinal direction.....2.4 m/s
Ridedown Accelerations
Longitudinal direction.....-0.6 g's

Maximum Change in Velocity.....5.28 ft/s (1.61 m/s)
Predicted High-Speed Change in Velocity.....m/s