



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
Washington, DC 20460

JUN 18 2013

OFFICE OF  
AIR AND RADIATION

Mr. Paul-Andre Lavoie, Eng., M.A.Sc.  
MJ EcoPower Hybrid Systems, Inc.  
A Division of Mi-Jack Canada  
9995 Catania Avenue, Local G  
Brossard, QC, Canada  
J4Z 3V7

Dear Mr. Lavoie:

The U.S. Environmental Protection Agency (EPA) has reviewed your request for verification of the MJ EcoPower Hybrid Systems, Inc. (EcoPower) EcoCrane Hybrid System (EcoCrane). The EcoCrane is a hybrid power system that replaces the conventional diesel generator set(s) on a rubber tired gantry crane (RTG). The EcoCrane includes a new diesel engine generator, batteries, inverter, rectifier, control system and energy recovery capabilities. Based on our evaluation of the application, test data and additional information provided, EPA hereby verifies that this technology reduces emissions of certain pollutants and improves fuel consumption by the percentages described below.

The technology is approved for use on the following applications provided all of the operating criteria are met.

Applications: The EcoCrane Hybrid System replaces generator set(s) equipped with Tier 0, Tier 1 or Tier 2 nonroad diesel engines on rubber tired gantry cranes.

The emission reductions shown below are based on when the original RTG is equipped with a generator using a Tier 2 engine and is replaced with the EcoCrane utilizing a Tier 3 engine. When original gensets are equipped with Tier 0 or Tier 1 engines, or when EcoCrane is equipped with a Tier 4 engine, higher emission reductions may be achieved.

Technology	Particulate Matter (PM) %	Carbon Monoxide (CO) %	Hydrocarbons (HC) %	Oxide of Nitrogen (NOx) %	Carbon Dioxide (CO <sub>2</sub> ) %
EcoCrane Hybrid System	74	71	96	84	58

In the application described above, EcoCrane demonstrated a 56% fuel economy improvement.

The following operating criteria must be met to achieve the aforementioned emission reductions.

- 1) The original RTG generator(s) must be equipped with Tier 0, Tier 1 or Tier 2 engines.
- 2) The original RTG must be equipped with a DC bus and AC motors or the EcoCrane package needs to be equipped with a properly sized power inverter to power the DC motors.
- 3) Prior to installation, EcoPower must appropriately size the EcoCrane Hybrid System for the original RTG. In sizing the EcoCrane, a smaller horsepower new diesel engine equipped generator and battery equipped energy system must be optimized to satisfy application-specific requirements.
- 4) The EcoCrane system includes the components necessary to replace a conventional RTG diesel engine generator and other original power system components as necessary. The EcoCrane components include a new genset equipped with a new diesel engine, battery energy storage system, rectifier, auxiliary inverter and regenerative brake/energy recovery system integration.
- 5) EcoPower and the RTG owner must evaluate battery technology options for the specific RTG. Different battery technologies may be preferable due to individual preference and performance requirements, so it is the responsibility of EcoPower and the RTG owner to select a technology based on these needs.
- 6) The EcoCrane system must include a battery monitoring system to alarm operators for necessary actions to ensure the proper operation of the batteries.
- 7) The owner's manual must include maintenance procedures, safety information and battery disposition.
- 8) The engine must be operated on ultra-low sulfur diesel fuel (ULSD) of 15 ppm or less.
- 9) The engine used in the EcoCrane system must be certified for use in generator sets and meet current model year standards.

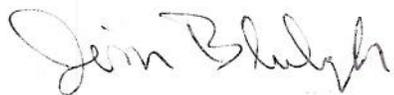
If EcoPower's EcoCrane Hybrid System is modified from the application description provided to EPA and representative of products tested, you must notify EPA immediately. This verification does not automatically confer to modified devices or devices that are similar to this original verification.

Information on EcoPower's EcoCrane Hybrid System, percent reduction, and applicable engines will be posted on the EPA's Verified Technology List website at:

<http://www.epa.gov/cleandiesel/verification/verif-list.htm>. As you know, EcoPower will be responsible for completing the required in-use testing program and for submitting all in-use testing data to EPA as outlined in EPA's in-use test methods.

Thank you for participating in EPA's Technology Assessment Center Verification Program. If you have any questions or comments, please contact Kuang Wei, of my staff, at 202-343-9329.

Sincerely,

A handwritten signature in cursive script that reads "Jim Blubaugh".

Jim Blubaugh, Deputy Director  
Transportation and Climate Division  
Office of Transportation and Air Quality