

## REQUEST # 50590-1 Novel Two-Mode Hydraulic Pump

**RESPONSE DUE DATE:** [November 16, 2007](#)

**MANAGER:** Irina Shiyanovskaya, Ph.D.

**SOLUTION PROVIDER HELP DESK:**

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### Opportunity

Contract research, joint development, licensing, supplier agreement

### Timeline

Phase 1 – Proof of concept in 6-9 months

Phase 2 – Commercial development

### Financials

Phase 1 - Proof of concept funding to be negotiated

Phase 2 - Joint development or commercialization to be negotiated

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### REQUEST FOR PROPOSAL DESCRIPTION

NineSigma, representing a **Fortune 100** company, invites proposals for the design and development of an **efficient hydraulic pump for automatic transmission systems**.

The successful new hydraulic system technology will:

- Provide two selectable positive displacement modes across the entire engine speed range (600-6000 rpm):
  - 1.5 -1.75 in<sup>3</sup>/rev in first mode
  - 1.0 in<sup>3</sup>/rev in second mode
- Satisfy requirements for low cost, compactness
- Have comparable efficiency comparable with fixed displacement pumps

### BACKGROUND

Hydraulic pumps in an automotive transmission system are efficient only in full flow and high oil demand regimes. However, cars are operated in full demand regimes only for a small part of an operational cycle. Existing variable displacement vane pumps exhibit low volumetric efficiency in idle and low power regimes with a partial flow. At high engine speed, fixed displacement pumps deliver too much oil. These drawbacks lead to increased fuel and energy consumption.

A new dependable and low-cost hydraulic pump system with improved efficiency for both partial and high demand applications is required.

### POSSIBLE APPROACHES

Potential innovative hydraulic pump technologies might include but are not limited to:

- Digital displacement hydraulics

- Efficient low-cost variable displacement pumps (with two displacements mode)

#### APPROACHES NOT OF INTEREST

The following approaches are not of interest:

- Dual pump system
- Fixed displacement pumps with recirculation circuits

#### ANTICIPATED PROJECT PHASES OR PROJECT PLAN

##### **Phase I - Proof of concept**

Develop a hydraulic pump concept and perform laboratory tests.

##### **Phase II - Commercial development**

Fabricate hydraulic pump systems for field testing. If the devices show promise, the technology will be scaled up for manufacturing.

#### CRITERIA FOR MOVING FROM PHASE 1 TO PHASE 2

Demonstrate a model hydraulic pump meeting the criteria above.

#### APPROPRIATE RESPONSES TO THIS REQUEST

Responses from **companies (small to large), academic researchers, and other research institutes** are welcome.

I am a **company or academic** with technology that should provide a solution ready for testing and transfer to commercial use.

I am a **company or academic** with technology that should provide a solution that requires further research and development to ready it for transfer to commercial use.

#### RESPONDING TO THIS REQUEST

##### NON-CONFIDENTIAL DISCLOSURE

By submitting a Response you represent that the Response does not and will not be deemed to contain any confidential information of any kind whatsoever.

Your Response is limited to no more than 3 pages. The Response should briefly describe the technical approach and provide information on technology performance, background, and description of the responding team and their related experience.

By submitting a Response, you acknowledge that NineSigma's client reserves the sole and absolute right and discretion to select for award all, some, or none of the Responses received in for this announcement. NineSigma's client may also only choose to select specific tasks within a proposal for award. NineSigma's client has the sole and absolute discretion to determine all award amounts.

##### RESPONSE EVALUATION

NineSigma's client will evaluate the **Response** using the following criteria:

- Overall scientific and technical merit of the proposed approach
- Approach to proof of concept or performance
- Potential for proprietary position (i.e., is the technology novel or protectable)
- Economic potential of concept
- Respondent's capabilities and related experience
- Realism of the proposed plan and cost estimates

The client will contact respondents with highly responsive proposals for next steps.