Modifications to the Small Generator Interconnection Procedures

Issues Paper

April 1, 2010

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1 Introduction

The small generator interconnection procedures (SGIP) set forth the requirements for interconnecting generating facilities no larger than 20 MW to the California ISO controlled grid. FERC's Order No. 2006 (issued May 12, 2005) standardized the terms and conditions of open-access interconnection service for small generating facilities. This continued FERC's standardization effort that began for large generators under FERC Order 2003. The SGIP is simpler than the large generator interconnection procedures (LGIP) and includes an accelerated path to interconnection. The ISO's SGIP utilizes a serial study approach where studies are done one at a time, in the order the applications are received and verified.[1] The overall study process includes the following five steps to facilitate interconnection to the ISO controlled grid. (1) interconnection customer submission of interconnection application, (2) conducting the feasibility study, (3) conducting the system impact study, (4) conducting the facilities study, and (5) completion and execution of the small generator interconnection agreement (SGIA).

The CAISO SGIP Tariff can be found at: http://www.caiso.com/2495/249594aa14840.pdf
The CAISO *pro forma* SGIA can be accessed at http://www.caiso.com/2495/249594f419150.pdf
The CAISO LGIP Tariff can be found at: http://www.caiso.com/2495/2495959721820.pdf

The ISO recently experienced a significant increase in the number of small generation projects seeking interconnection to the ISO controlled grid. The large volume exacerbated problems inherently associated with processing a large number of requests serially, and also revealed areas of the ISO's SGIP process that need improvement. To accomplish improvements to the SGIP, the ISO initiated a stakeholder process to obtain interested party participation to evaluate and consider SGIP modifications. In an effort to ensure that this issues paper reflected more than just the ISO's concerns, the ISO conducted two informal issue gathering meetings to gather input for inclusion in this document. The first meeting collected the input of participating transmission owners and the second meeting solicited input from developers of small

[1] The SGIP does provide an option for the CAISO to conduct system impact studies in clusters, in coordination with the applicable PTO, Interconnection Requests (SGIP Section 1. 3.6).

generation projects. The issues identified in discussions at those meetings are set out in this paper. The ISO also created a stakeholder initiative webpage http://www.caiso.com/275e/275ed48c685e0.html to post additional information for the modifications to the SGIP stakeholder process. The currently effective SGIP and SGIA can be accessed on the ISO website at the links listed above.

2 Issues Relating to Small Generation Processing

This section reflects the issues identified by the ISO, participating transmission owners (Participating TOs or PTOs), small generation project developers and others making comments to the ISO over the course of the ISO's implementation to date of the SGIP. This stakeholder process may not address all issues identified below. Issues not addressed will be retained for future consideration.

2.1 Study Process

Background

As stated earlier, the SGIP is a serial process where each project is studied in chronological order, based on the date that the ISO receives and validates the customer's interconnection request. The current tariff timelines anticipate that a request can be completed in four hundred thirty (430) calendar days if each party (the PTO, the interconnection customer and the ISO) can complete each task by each task date. (See Attachment 1 - SGIP Study Process Overview.)

Issues

2.1.1 The time required for the SGIP study process

The timeliness of the current SGIP process, even under the best of circumstances, makes it difficult for project developers to obtain other needed project approvals (such as land use permitting and/or environmental review approvals). Is it acceptable for modifications to the SGIP process to increase the current timelines?

2.1.2 SGIP serial study process coordination with the large generation interconnection procedures (LGIP)

Now that the LGIP study process is conducted in clusters of applications (in which two cluster windows are studied annually) whereas the serial study method is still in place for the SGIP, it is difficult to coordinate the two processes and to meld the incoming projects under each process to develop meaningful base cases for use in either the LGIP or SGIP. The number of data inputs, assumptions, and the increased pace of changing circumstances adds a lot of uncertainty in terms of timing, identifying specific build-outs to interconnect specific projects, and costs.

In order to get accurate results, all higher queued projects including cluster projects, serial projects and wholesale distribution access tariff projects should

be modeled in the study base cases. Higher queued projects, especially LGIP projects cannot be accurately modeled because the system upgrades are not known until LGIP studies are complete.

2.1.3 Delays caused by the increasing volume of SGIP projects

As the number of SGIP projects continues to grow, especially in prime renewable resource areas, customers experience delays in meeting the required tariff study timelines because there are more data points to consider together. The serial study approach inherently requires results to be completed for the higher queue projects (for inclusion) before studies can be completed for subsequent lower queued projects that connect in the same geographical area.

2.1.4 Detail and necessity of the feasibility study

What detail should the small generation feasibility studies include? What study work should be done for a feasibility study? What is driving the current study plan requirements at the feasibility study stage of the interconnection study process? Should the feasibility studies just test the injection of the project's proposed MW value at the point of injection to see if there are any short circuit impacts?

What is the value of a feasibility study? One viewpoint is that a feasibility study does not provide much value for small projects. Others considered the study to be a valuable source of information. The current SGIP does allow for projects to waive their feasibility study. The drawback for a project that elects to waive its feasibility study is that it will still have to wait for higher queued projects located in the same geographical area to finish the study process before the small project can be studied accurately.

2.1.5 Interconnection request data requirements

Too much information (one viewpoint), or not enough (another) is required with the application. One viewpoint is that too much technical information is required with the initial interconnection request application form and the information requested is not needed at the next action, which is to prepare the feasibility study. Another viewpoint is that, in order to complete the studies in a timely fashion and to make sure all higher queued projects are modeled correctly, the current level or even more technical data is needed with the application.

The interconnection request application form is not well defined and the ISO staff generally asks for additional data at the scoping meeting.

The SGIP should provide additional time for developers to provide additional technical data not originally requested with the application. Five days is often not sufficient.

2.1.6 Should the SGIP accommodate re-studies?

The current SGIP does not accommodate re-studies and therefore is not flexible when circumstances change. This puts additional pressure on the engineers to anticipate and provide multiple scenarios and cost estimates, therefore

increasing the time required to complete studies. Ultimately the study plans developed do not reflect the intent of the SGIP. The SGIP did not anticipate re-study because it anticipated that the process would be completed so quickly re-studies would not be necessary.

Re-studies may be warranted especially when a higher queued project in the vicinity of the project under study is withdrawn, or when upgrades are identified after completion of LGIP studies.

2.1.7 Availability of the current base case data for use by project developers

The base cases that are available to developers often appear to be two or three iterations behind the current base cases being used by the ISO and participating transmission owners.

Should there be more coordination or transparency of the wholesale distribution access tariff projects being studied? Not knowing about the wholesale distribution access tariff projects, it is difficult to understand which of the SGIP projects are viable.

Should the wholesale distribution access tariff queue be made available to help project developers determine the feasibility of the point of interconnection for a project?

2.1.8 Delays and uncertainty in study results caused by projects that withdraw

Should viability of projects be a required screen to increase the validity of the study process.

2.2 Deliverability

Background

Deliverability for a supply resource is a prerequisite for the resource to be able to provide and be compensated for resource adequacy (RA) capacity under the resource adequacy program. SGIP currently does not have an option for projects to request deliverability, and hence generation projects that interconnect to the ISO grid via the SGIP are not eligible to provide RA capacity. Projects that desire deliverability must instead go through the LGIP, which includes a deliverability assessment and opportunity to have delivery network upgrades constructed as part of the interconnection. Unlike the LGIP, the SGIP does not involve constructing of delivery network upgrades for the small generating facility.

The goal of the ISO generator deliverability study methodology is to determine whether the aggregate of generation output in a given area can be simultaneously transferred to the remainder of ISO balancing authority area. Any generators requesting full capacity deliverability status in their interconnection request to the ISO controlled grid must utilize the LGIP rather than the SGIP, and will be analyzed

through a deliverability assessment for deliverability in order to identify the delivery network upgrades necessary to obtain this status[2].

It is important to note that deliverability status, although it does qualify the resource to provide RA capacity, does not bestow upon the interconnecting generation any priority for purposes of scheduling energy in the ISO markets or delivering energy in real time when there is grid congestion or over-generation. Scheduling and real-time dispatch of generation to balance supply and demand and manage congestion are accomplished through submission of bids (economic bids or self-schedules) to the ISO day-ahead and real-time markets.[3] Generation access to the transmission system is a function of the ISO spot markets, not deliverability status.

Another concept pertinent to deliverability in the context of the RA program is the concept of net qualifying capacity. A generating facility that is interconnected with full capacity deliverability status is deemed to have some MW quantity of net qualifying capacity (above zero) which it is eligible to offer as a resource adequacy resource. Thus the RA program is another potential revenue stream for generating facilities that are deliverable. Currently in California, resource adequacy revenue opportunities for generating facilities arise out of contracts between supply resources and load serving entities. For purposes of discussion here, the important point is that generating facilities with energy only deliverability status are deemed to have a net qualifying capacity of zero, and cannot be offered as resource adequacy resources so access to this potential revenue stream is unavailable to them.

The CPUC and the local regulatory authorities that administer the RA programs for their jurisdictional load-serving entities determine a MW value of qualifying capacity (QC) for each resource that desires to offer RA capacity. The ISO then refines the QC values for these resources by conducting a deliverability study for each resource to determine the resource's net qualifying capacity (NQC). The deliverability assessment evaluates whether the grid facilities that will be affected by the resource have sufficient capacity to deliver the resource's output to serve system load under certain specified conditions and assumptions. The ISO posts documentation explaining the ISO's deliverability analysis on the ISO website at http://www.caiso.com/23d7/23d7e41c14580.pdf. The ISO performs a deliverability study for each resource, and focuses on peak demand conditions. The collective

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[2] See, for example, SGIP Section 1.3.8, which directs SGIP interconnection customers seeking full capacity deliverability status to be processed under the LGIP:

> **1.3.8 Request for Deliverability Assessment**
>
> An Interconnection Customer seeking to interconnect to the CAISO Controlled Grid that desires to have a Deliverability Assessment performed for the Small Generating Facility shall be required to have its Interconnection Request processed under the Large Generator Interconnection Procedures (LGIP) ….

[3] See, for example, LGIP Section 2.4.2:

> **2.4.2 The Product.**
> Interconnection Service allows the Interconnection Customer to connect the Large Generating Facility to the CAISO Controlled Grid and be eligible to deliver the Large Generating Facility's output using the available capacity of the CAISO Controlled Grid. Interconnection Service does not in and of itself convey any right to deliver electricity to any specific customer or point of delivery or rights to any specific MW of available capacity on the CAISO Controlled Grid.

results of these deliverability studies are then incorporated into an ISO net qualifying capacity annual report, prepared under Section 40.4.2 of the ISO tariff. The net qualifying capacity values for the resources will be effective for the next resource adequacy compliance year following the report.

When an interconnection customer elects an interconnection service that interconnects to the ISO controlled grid with energy only deliverability status, the financial result is that the interconnection customer is responsible only for the construction costs of reliability network upgrades. Delivery network upgrades are not built for the energy only project (even if delivery network upgrades had been initially planned in an earlier study that contemplated full capacity deliverability), and so the customer is not responsible for construction costs of delivery network upgrades. The generating facility connected as energy only will be deemed to have a net qualifying capacity of "zero" and therefore, will not qualify for consideration as a resource adequacy resource.

Deliverability Issues Related to Interconnecting Small Generation

2.2.1 Should SGIP have an option for deliverability?

Small facilities should have an ability within the SGIP to choose an option for a deliverability study without having to move to the LGIP. The concern is that LGIP is too expensive and too slow a process to obtain full capacity deliverability status. Should the SGIP process be delayed because of a deliverability study?

2.2.2 Should there be an opportunity to have "partial deliverability"?

If a project cannot be deemed fully deliverable, should it have an option for partial delivery status?

2.2.3 Should there be a later opportunity to change deliverability status after generator is commercially operational?

Could there be a process for existing generating facilities to request a change in deliverability status, at a later point in time, through a subsequent interconnection request, after the commercial operation date of the facility?

2.2.4 How would a change in policy affect existing generation and/or existing projects in the queue?

Careful consideration needs to be given to how any proposed changes will affect existing projects that are on-line and are in the queue that made very deliberate decisions for their business model. Changes to the deliverability rules could have unintended consequences to advantage some projects over others.

2.3 Cost Certainty

Background

The SGIP requires that the facilities study specify and estimate the cost of the equipment, engineering, procurement and construction work (including overheads) needed to implement the conclusions of the system impact study.

Issues

2.3.1 Developers desire cost certainty

Developers have stressed that, to obtain financing, it is critical to be provided with cost certainty regarding the generator cost responsibility for the interconnection build out. The current practice, where multiple cases are provided in the facility study report, causes uncertainty that can inhibit or prevent timing or success for financing.

Due to the interrelationship between the SGIP project study and LGIP projects beings studied concurrently in the parallel LGIP process, the interconnection customer could see significant difference in cost estimates for its SGIP project interconnection from the time of the initial (feasibility) study and the time the estimates are detailed in the facilities study. The significant difference in cost estimates can arise because the initial feasibility study would have been conducted with one set of assumptions about the LGIP projects connecting in the same area, but by the time that the SGIP project facilities study is done, the LGIP project assumptions change, especially if the network upgrades are identified.

2.3.2 How to minimize the impacts caused by projects that drop out of the queue?

Projects dropping out of the queue affect the ability to provide cost certainty, especially since SGIP is a serial study process.

2.3.3 Accuracy of the per unit construction cost estimates

Accurate cost estimates are not possible when using inflated per unit cost estimates. Inflated cost estimates may prevent otherwise viable projects from continuing in the process.

2.3.4 Effects of adding cost certainty measures to the overall SGIP timeline

Increasing the accuracy of costs estimates will increase the overall SGIP timeline. Is this an acceptable tradeoff?

2.4 Eligibility Criteria

Background

Currently the SGIP is applicable to interconnections to the ISO controlled grid of new generating facilities with a generating facility capacity of 20 MW or less, or the

expansion of an existing generating facility with a resultant generating facility capacity of 20 MW or less.

Any proposed interconnection of a new generating facility to a participating transmission owner's distribution system will be processed, as applicable, pursuant to the applicable participating transmission owner's wholesale distribution access tariff or CPUC Rule 21, or other local regulatory authority requirements of the participating transmission owner. For any proposed interconnection regardless of size that desires a deliverability assessment, the interconnection customer must submit an interconnection request to the ISO under the LGIP.

Issues

2.4.1 LGIP projects broken up into multiple SGIP projects

There is concern that the SGIP process is being used to bypass the LGIP process. In effect, larger projects are broken up into 20 MW projects and submitted to the SGIP. This causes multiple studies to be completed where a single project could have been submitted in the LGIP process. This in turn may cause delays in the SGIP process for some projects.

There needs to be very clear and transparent criteria for classifying SGIP projects versus LGIP projects.

2.4.2 Real vs. Speculative projects

Should specific milestones or additional screens be added in addition to site control to reduce the number of speculative projects? Queue position should not provide value, remove incentives to obtain and hold queue positions, even after an SGIA has been executed. Opinions differ on whether additional steps should be taken or whether SGIP should allow developers to place applications for projects that are somewhat speculative since speculation is sometimes an aspect of project development.

2.4.3 Generation MW size

There may be a need to change the maximum allowed MW size (currently 20 MW), possibly to better reflect other permitting or regulatory processes.

2.4.4 MW Increases to existing projects

The SGIP should include the ability to increase the MW capacity of existing generating facilities when under current circumstances the increase would trigger LGIP—such as increasing a facility MW by an increment of less than 20 MW. Such increases are generally accomplished through change in technology, retrofitting, or increasing plant efficiency.

2.4.5 Site Control

SGIP currently requires demonstration of site control at the time the application is submitted. Requiring site control at the onset may be too restrictive. In contrast, the LGIP permits a customer to provide an additional deposit in lieu of site control at the initial application stage.

2.5 Application and Study Fees

Currently the SGIP fee structure is as follows:

- Application deposit = $1,000
- Feasibility Study deposit = Lesser of 50% of estimated study costs (estimates typically $15,000-$30,000) or $1,000
- System Impact Study deposit = 50% of estimated study cost (estimates typically $30,000-$50,000)
- Facility Study deposit = 100% of estimated study cost (estimates typically $30,000-$50,000)

2.5.1 Appropriateness of amount

Costs too low: The costs to initially apply and proceed through various study stages of the SGIP are much too low and encourage speculative projects to enter the queue. In addition, the costs should be more in line with LGIP. The initial application cost of $1,000 may be the only SGIP process cost that is too low.

Costs appropriate: The costs are appropriate and should not be changed. Increased application fees should not discourage small business development of small generating facilities.

2.6 Small Generator Interconnection Agreement Issues

2.6.1 Pace of SGIA completion

After the completion of the interconnection studies, the next component of the interconnection process is the completion and execution of the Small Generator Interconnection Agreement (SGIA)[4] Like the LGIA, the SGIA is a *pro forma* agreement with standard terms and conditions. Like the LGIA, negotiation pertains to the completion of the standard form attachments to include the details that are specific to the interconnection. These include

(i) the description and costs of the components of the physical interconnection (Attachment 2 to the SGIA);

(ii) the construction milestones relating to the interconnection build-out and the generating facility (Attachment 4 to the SGIA) Important dates for the generating facility include the commercial operation date, and the dates for certain testing and power access (i.e. backfeed power)

The SGIP anticipates a shorter process of approximately 35 days. Within 30 days after the facilities study is completed, the interconnection customer is to agree to pay for the identified interconnection facilities and upgrades identified in the facilities study and request tender of an SIGA (or withdraw.) An executable SGIA is to be sent to the interconnection customer 5 business days later.

2.6.2 Detail of the SGIA

[4] As mentioned above, the SGIA can be accessed at http://www.caiso.com/2495/249594f419150.pdf

The terms and conditions of the SGIA *pro forma* are not detailed enough as compared to the LGIA, and that some of the more detailed terms of the LGIA should be considered for inclusion.

2.7 Miscellaneous SGIP tariff issues:

2.7.1 Detail of the SGIP tariff

The SGIP tariff is very brief as compared to the LGIP tariff and in many instances relies on the LGIP tariff. For example, the level of accuracy in cost estimates of network upgrades is not defined in the SGIP. The LGIP level of accuracy of 20% is used for SGIP cost estimates. Another example is a three year extension in the commercial operation date allowed under the LGIP but not mentioned in the SGIP. This three year extension is used for SGIP projects as well.

On the other hand, re-study is allowed under the LGIP but it is not allowed in the SGIP. Examples like these have created instances of misinterpretation of tariff among the ISO, participating transmission owners and the project developers.

Provide all the necessary details in the SGIP tariff so that it can be a stand-alone process.

2.7.2 Clarity of SGIP tariff definitions

There exists some confusion about what facilities constitute interconnection facilities and what constitutes network upgrades. For example, in a three-breaker ring bus interconnection, do all three breakers constitute network upgrades or just two? If a bus also needs to be extended to accommodate the new interconnection, is that an interconnection facility or network upgrade? When a project is tapped to a transmission line, which facilities (disconnect switches, line connectors, etc) are network upgrades?

Likewise, clear definition of full capacity and energy only projects would avoid misunderstandings because these terms have different meanings in other parts of the country.

3 Schedule

This section discusses the ISO's schedule to prepare small generation interconnection procedures that meet the needs of stakeholders.

Date	Event
April 1	Issues Paper posted to ISO website
April 12	Stakeholder meeting to discuss Issues Paper

April 19	Written stakeholder comments due on Issues Paper
April 29	Working Group meeting #1
May 14	Working Group meeting #2
May 26	Straw Proposal posted to ISO website
June 3	Stakeholder meeting to discuss Straw Proposal
June 15	Written stakeholder commends due on Straw Proposal
June 25	Working Group meeting #3
July 8	Working Group meeting #4
July 12	Draft Final Proposal posted to ISO website
July 20	Stakeholder meeting to discuss Draft Final Proposal
July 27	Written stakeholder comments due on Draft Final Proposal
Week s of August 2 & Aug 9	Additional stakeholder engagement if necessary
Aug 13	Stakeholder Process Complete
Sep 9-10	Board of Governors meeting – approval of modified SGIP requested
Week of Sep 13	Draft tariff language posted
Week of Sep 20	Written stakeholder comments on draft tariff language due
Week of Sept 27	Stakeholder meeting to discuss draft tariff language
Week of Oct 12	Tariff language filed at FERC
Week of Dec 20	FERC Order Issued

4 Next Steps

The ISO requests that stakeholders provide written feedback to this issues paper to the ISO. The feedback should include comments on the issues addressed in this paper or other topics that should be considered in this effort to modify the SGIP. For convenience, a template has

been created for stakeholders to submit written comments to the ISO. The template can be found on the ISO website http://www.caiso.com/275e/275ed48c685e0.html after the meeting. Written comments should be submitted to the ISO by e-mail, using the template, no later than April 19, 2010, sent to dkirrene@caiso.com. Comments received by the ISO will be posted to the ISO website http://www.caiso.com/275e/275ed48c685e0.html and considered in connection with further activities for the SGIP modification initiative.

Before the ISO posts its straw proposal, two working group meetings will be held with interested and committed stakeholders. Individuals willing to work through issues collaboratively are invited to actively participate in a working group. At the working group level issues and potential solutions will be explored in detail. Members of the working group will be expected to complete assignments which may include research, writing and presenting. The working group will meet at the California ISO from 10:00 a.m. – 3:00 p.m. (Pacific Time) April 29, May 14, June 25, July 8 (11:00 a.m. to 3:00 p.m.), and August 5. If you are willing to actively participate in the California ISO's development of modifications to the small generation interconnection procedures please send an email to dkirrene@caiso.com with your name, company and contact information by April 15, 2010.

Attachment 1 - SGIP Study Process Overview

[Time stated in Business Days (BD)]

1. ISO determines that project cannot be processed under SGIP Fast Track or Inverter Process—Fast track does not apply if project is larger than 2 MW but no larger than 20 MW, is not certified, or is certified but did not pass Fast Track or 10 kW Inverter Processes.

2. ISO notifies IC [Interconnection Customer] of receipt of IR [Interconnection Request], documentation of site control, and $1,000 deposit **(3 BD)**

3. ISO notifies IC that the IR is either complete or incomplete **(10 BD)** (referred to as "validation")

4. The IC must provide the ISO with the information listed on an "incomplete notification" or request extension of time to provide information **(10 BD)**

5. **Scoping Meeting** held once IR deemed complete. **(10 BD)** Purpose is to bring together appropriate personnel resources required to accomplish meeting purposes. Purpose of meeting is to: (a) discuss IR and review existing studies relevant to IR, (b) determine which study (Feasibility, System Impact, Facilities) or if IA [Interconnection Agreement (an SGIA for a small generation interconnection)] will initiate the process.
   - **5 BD after Scoping Meeting –** IC must specify where the Point(s) of Interconnection (POI) are.
   - **ISO** prepares scoping meeting minutes

6. **Feasibility Study**
   - **5 BD -** ISO to provide **Feasibility Study Agreement** including outline of scope of study and non-binding good faith estimate of cost to perform the study**.**
   - **15 BD –** IC executes and returns the Feasibility Study Agreement and study deposit (lesser of 50% of estimated cost or $1,000) (FSA)
   - **30 BD – ISO issues the final Interconnection Feasibility Study Report to IC**

7. **System Impact Study (SIS)**
   - **5 BD -** ISO to provide **System Impact Study Agreement** including outline of scope of study and non-binding good faith estimate of cost to perform study
   - **30 BD –** IC executes and returns the **System Impact Study Agreement** and study deposit (**50%** of good faith estimate)
   - **45 BD – ISO** issues the final (**SIS**) report to **IC**

8. **Facilities Study (FAS)**
   - **5 BD -** ISO sends IC a **Facilities Study Agreement** including outline of scope of study and non-binding good faith estimate of cost to perform study, or PTO sends an executable IA
   - **30 BD –** IC returns executed **Facilities Study Agreement** and study deposit (**full amount** of good faith estimate)
   - **30 BD –** If **No** network upgrades are required –time for **ISO** to issue the final (**FAS**) report to **IC**
   - **45 BD –** If network upgrades are required—time for **ISO** to issue the final (**FAS**) report to **IC**

9. **Small Generator Interconnection Agreement (SGIA)** – Time frame for completion of the Facilities Study:
   - **30 BD –** The IC shall (a) agree to pay for identified Interconnection Facilities and upgrades and request IA from PTO, (b) withdraw IR, or (c) request IA from PTO despite disagreement with costs in Facilities Study and request SGIA be filed unilaterally at FERC**.**

- **5 BD –** PTO will provide IC and executable SGIA

10. Prior to SGIA execution, IC may request an E&P [Engineering & Procurement] Agreement authorizing PTO to begin engineering and procurement of long lead-time items. This is optional and will not alter IC's Queue Position or In-Service Date.