

**TFWP OPS/BE
 QUESTIONS AND ANSWERS**

Date: August 8, 2014	SF # [REDACTED]
Team Leader: Claudetter J.	ER ID [REDACTED]
Officer: Judith Lu	ER Name: Lumerical Computational Solutions, Inc
<p>In this LMIA application, ER requested to have an exemption of transition plan under unique skills. As per PO's suggestion, ER provided additional information to explain the business and the position.</p> <p><u>- About the business</u></p> <p>> We are one of the four main companies in the world that produce software products that are used to design optical components, optical systems and optical processes involving extremely small (i.e. nanoscale) objects – this field is called nanophotonics, with nano referring to sizes of nanometers (billionths of a meter) and photonics being the science of light and matter. By extremely small, we mean objects that are typically tens to hundreds of nanometers in size, or objects having features smaller than this size. At this size, these objects have unique properties that require advanced computational methods to predict how light behaves. For example, at very large sizes, a metallic surface (e.g. coated on glass as in a mirror) will reflect light, whereas tiny metallic objects may be entirely transparent to light under the right conditions.</p> <p>> In order to build software products that can accurately predict how light behaves with such small size scales, significant training, experience and education (typically at a PhD level) is required in order to 1) understand the background electromagnetic theory, and 2) produce computer code that makes use of that theory in a way that can be applied to arbitrary designs that are input into the software by the end user.</p> <p>> As a concrete example, many manufacturers of cellphone cameras use our products to design individual pixel geometries, including the choice of materials and dimensions, for the camera sensor chip that captures light and creates the image when a photograph is taken. Each pixel within a modern 5-6 megapixel camera is about 1 micron (one millionth of a meter) wide – such that you could fit about 50 such pixels across the width of a human hair. Our products are used by design engineers to explore how different choice of materials and geometries of those pixels can be adjusted to make for the best image. You can see an animated movie of how light moves through and interacts with the internal structures within such a camera pixel here: http://docs.lumerical.com/en/cmos.html. Engineers use our products to prototype how new device designs work on a computer before manufacturing physical prototypes as it is very expensive to build prototypes of objects this small and complicated; prototypes making use of modern semiconductor manufacturing as would be typically required could cost upwards of a million dollars.</p> <p><u>- About this unique position</u></p> <p>> The education and experience level required for this position is a PhD with at least 10 years of experience in this field. There are only a very small number of people in Canada who could meet these qualifications.</p> <p>> The field of electromagnetics is an established field of study as it pertains to low and high frequency electronics (things like wi-fi, and cellphone antenna design). However, computational electromagnetics at optical frequencies is much less common, and there have been significant innovations only since 2000 in this field, reducing the availability of well-trained individuals.</p> <p>> While nanophotonic designers are more common, individuals having significant knowledge of the underlying theory are less common. To use an analogy, many people know how to use a computer, but there are a lot less people that know how to build that computer. So while we are able to find many customers/end users of our products, finding people able to develop those products is much more challenging.</p> <p>> Not many companies exist where one can get relevant experience in this field. In the world, there are four main companies including Lumerical that produce similar software design products. That only leaves one other company in Canada that we could likely recruit from, and most high tech companies use non-</p>	

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<p>competition clauses in their employment agreement making that possibility unlikely.</p> <p>> Given this, the most likely place to recruit from would be from a university where individuals are working as a professor or a post-doc in the field of photonics. However, research into computational nanophotonics is uncommon in Canada, and to recruit this kind of individual they would need to make a conscious choice to change from an academic career in a university to move to industry.</p>
<p>Question/Issue:</p> <p>As per current program guideline, the exemption of transition plan needs to be reviewed by BE to determine if it can be granted.</p>
<p>Resources Searched:</p> <p><input type="checkbox"/> Policy / Directives <input type="checkbox"/> NOC website <input type="checkbox"/> FWIS history <input type="checkbox"/> LMI</p> <p><input type="checkbox"/> Other (please describe below)</p> <p>TFWP website WiC</p>
<p>Officer & TL Recommendations:</p> <p>The information provided is very scientific. PO recommends accepting the request of exemption based on the education and experience level required for the position. ER is making products with scientific and technological innovation, thus, it is reasonable to hire professional with special and unique skills.</p>
<p>BE Consultant Response:</p> <p><u>QUESTION / RESPONSE</u></p> <p>As per current program guideline, the exemption of transition plan needs to be reviewed by BE to determine if it can be granted.</p> <p>Upon further review the information provided by the employer, including the job details, requirements and wages this occupation does not appear to meet the "Unique Skills" requirement.</p> <p>The Unique Skills exemption is only granted in very limited cases; where the occupation is seen to be extremely rare /exceptional and the skills and requirements required to fulfill the job duties are not commonly found and / or utilized in a wide variety of fields globally. The remuneration for positions that meet the "Unique Skills" requirement are <i>typically</i> higher than mainstream or standard wages; as the level of expertise required can be quite exclusive.</p> <p>In this case it is recommended that the Officer contact the employer and request a Transition Plan.</p> <p>Consultant: <u>Kristine Dalton</u>, BEA – September 11, 2014</p> <p>Forward to: W-T-FWR_Constant-DTE_Conseiller-GD</p>

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