



شرکت مدیریت تولید برق اصفهان

Esfahan Power Generation Management Co.



بولتن آماری اسفند ماه ۱۳۹۶



تهیه شده در معاونت مهندسی و برنامه ریزی



CONTENTS

| <i>Page</i> | <i>Description</i> | <i>Page</i> | <i>Description</i> |
|------------------|---|------------------|--|
| | <i>Esfahan Power Generation Management Co.</i> | <i>16</i> | Monthly Net Generation Comparison in year |
| <i>1</i> | Contractual Generation - Actual Generation | <i>17</i> | Monthly Fuel Consumption Comparison in year |
| <i>2</i> | Monthly Plants Production Graph | | <i>Hesa Power Plant</i> |
| <i>3</i> | Total Plants Information from First Synchronizing | <i>18</i> | Total Units Information from First Synchronizing |
| <i>4</i> | Plants Fuel Consumption Comparison | <i>19</i> | Units Monthly Production Comparison |
| <i>5</i> | Monthly Plants Thermoelectric Information | <i>20</i> | Monthly Units Thermoelectric Information |
| <i>6</i> | Monthly Plants Avail. & Unavailability | <i>21</i> | Monthly Units Availability & Unavailability |
| <i>7</i> | Annual Plants Unavailability | <i>22</i> | Annual Units Unavailability |
| | <i>Esfahan Power Plant</i> | <i>23</i> | Monthly Fuel Type & Consumption Graph |
| <i>8</i> | Total Units Information from First Synchronizing | <i>24</i> | Monthly Fuel Consumption , Delivery , Store (Lit,Mc) |
| <i>9</i> | Units Monthly Production Comparison | <i>25</i> | Gross Production , Internal Consumption Comparison |
| <i>10</i> | Monthly Units Thermoelectric Information | <i>26</i> | Description of Abbreviation |
| <i>11</i> | Monthly Units Availability & Unavailability | | |
| <i>12</i> | Annual Units Unavailability | | |
| <i>13</i> | Monthly Fuel Type & Consumption Graph | | |
| <i>14</i> | Monthly Fuel Consumption , Delivery , Store (Lit,Mc) | | |
| <i>15</i> | Gross Production , Internal Consumption Comparison | | |

فهرست

| صفحه | شرح | شرح | صفحه |
|------|---|--|------|
| | | شرکت مدیریت تولید برق اصفهان | |
| 1 | | پیش بینی تولید - قرارداد با عملکرد واقعی | |
| 2 | | نمودار تولید ناخالص ماهیانه دونیروگاه تحت پوشش | |
| 3 | | اطلاعات تولید و ساعت کار نیروگاهها از اولین پارلر باشبکه و از آخرین اورهال | |
| 4 | | کل مصرف سوخت ماهیانه | |
| 5 | | اطلاعات تولید، سوخت، نرخ حرارتی، تعداد خروج و استارت دونیروگاه | |
| 6 | | در دسترس و غیر دسترس بودن دونیروگاه - ماهیانه | |
| 7 | | در دسترس نبودن نیروگاهها - از ابتدای سال جاری | |
| | | نیروگاه اصفهان | |
| 8 | | اطلاعات تولید و ساعت کار واحدها از اولین پارلر باشبکه و از آخرین اورهال | |
| 9 | | مقایسه تولید واحدها - درصد | |
| 10 | | اطلاعات تولید، سوخت، نرخ حرارتی، تعداد خروج و استارت واحدها | |
| 11 | | در دسترس و غیر دسترس بودن واحدها - ماهیانه | |
| 12 | | در دسترس نبودن واحدها - از ابتدای سال جاری | |
| 13 | | درصد مصرف سوخت های مختلف | |
| 14 | | وضعیت مصرف و تحویل و ذخیره سوخت - ماهیانه | |
| 15 | | مقایسه درصد مصرف داخلی و تولید ناخالص واحدها - سال جاری و سال گذشته | |
| 16 | مقایسه تولید خالص ماهیانه در سال جاری | | |
| 17 | مقایسه درصد مصرف سوخت ماهیانه در سال جاری | | |
| | نیروگاه هسا | | |
| 18 | اطلاعات تولید و ساعت کار واحدها از اولین پارلر باشبکه و از آخرین اورهال | | |
| 19 | مقایسه تولید واحدها - درصد | | |
| 20 | اطلاعات تولید، سوخت، نرخ حرارتی، تعداد خروج و استارت واحدها | | |
| 21 | در دسترس و غیر دسترس بودن واحدها - ماهیانه | | |
| 22 | در دسترس نبودن واحدها - از ابتدای سال جاری | | |
| 23 | درصد مصرف سوخت های مختلف | | |
| 24 | وضعیت مصرف و تحویل و ذخیره سوخت - ماهیانه | | |
| 25 | مقایسه درصد مصرف داخلی و تولید ناخالص واحدها - سال جاری و سال گذشته | | |
| 26 | توضیحات و اصطلاحات | | |

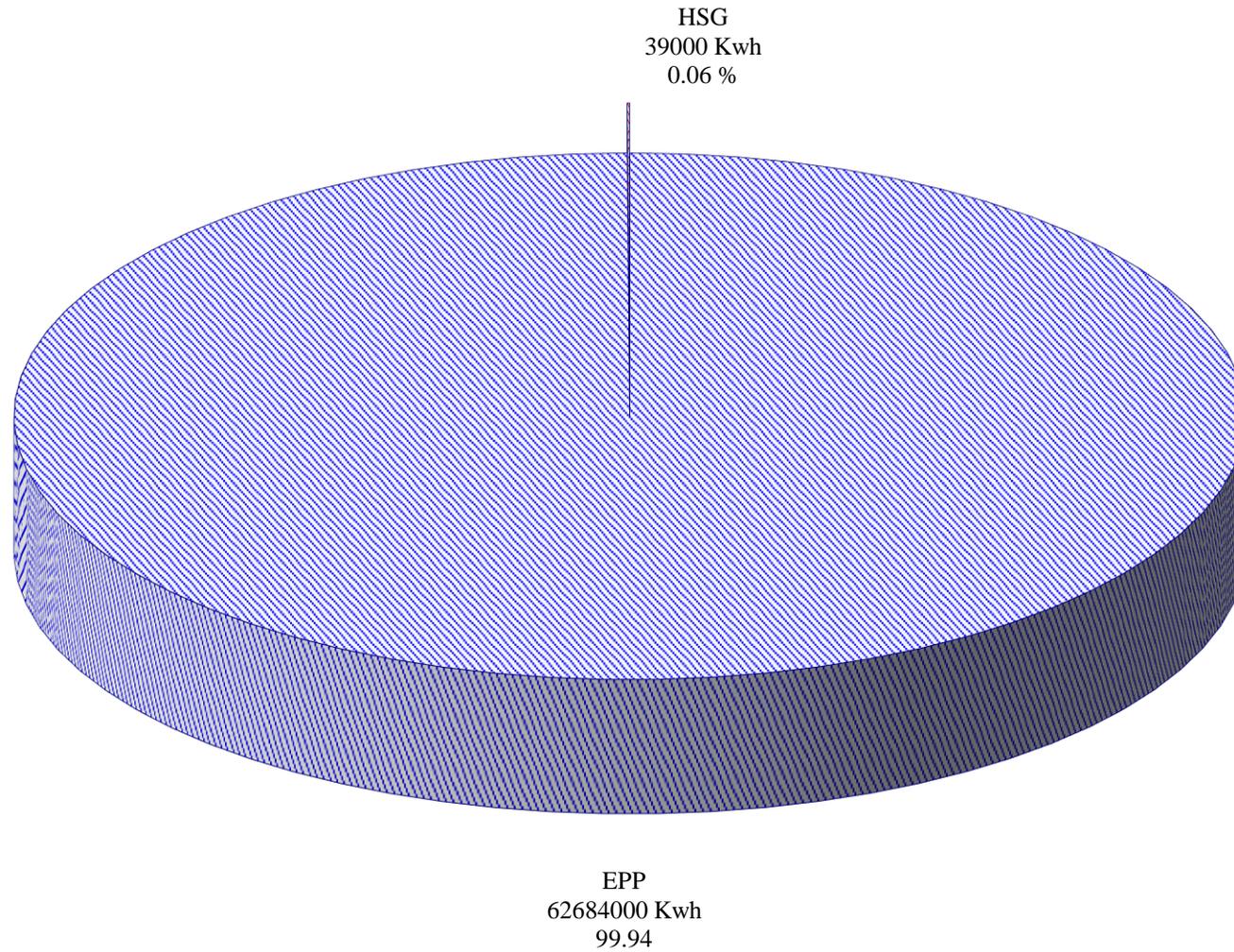
Contractual Generation - Actual Generation till (1396/12/29)

| Plant | Contractual Net generation | Actual Net Generation | Actual | Reminded | Cont.Net generation till this month | Deviation till this month |
|-------|----------------------------|-----------------------|---------|------------|-------------------------------------|---------------------------|
| Code | KWH | KWH | % | KWH | % | % |
| EST | 3,500,000,000 | 3,572,478,000 | 102.07% | 72,478,000 | 100.00% | 2.07% |
| HSG | 56,000,000 | 49,455,960 | 88.31% | -6,544,040 | 100.00% | -11.69% |
| Total | 3,556,000,000 | 3,621,933,960 | 101.85% | 65,933,960 | 100.00% | 1.85% |

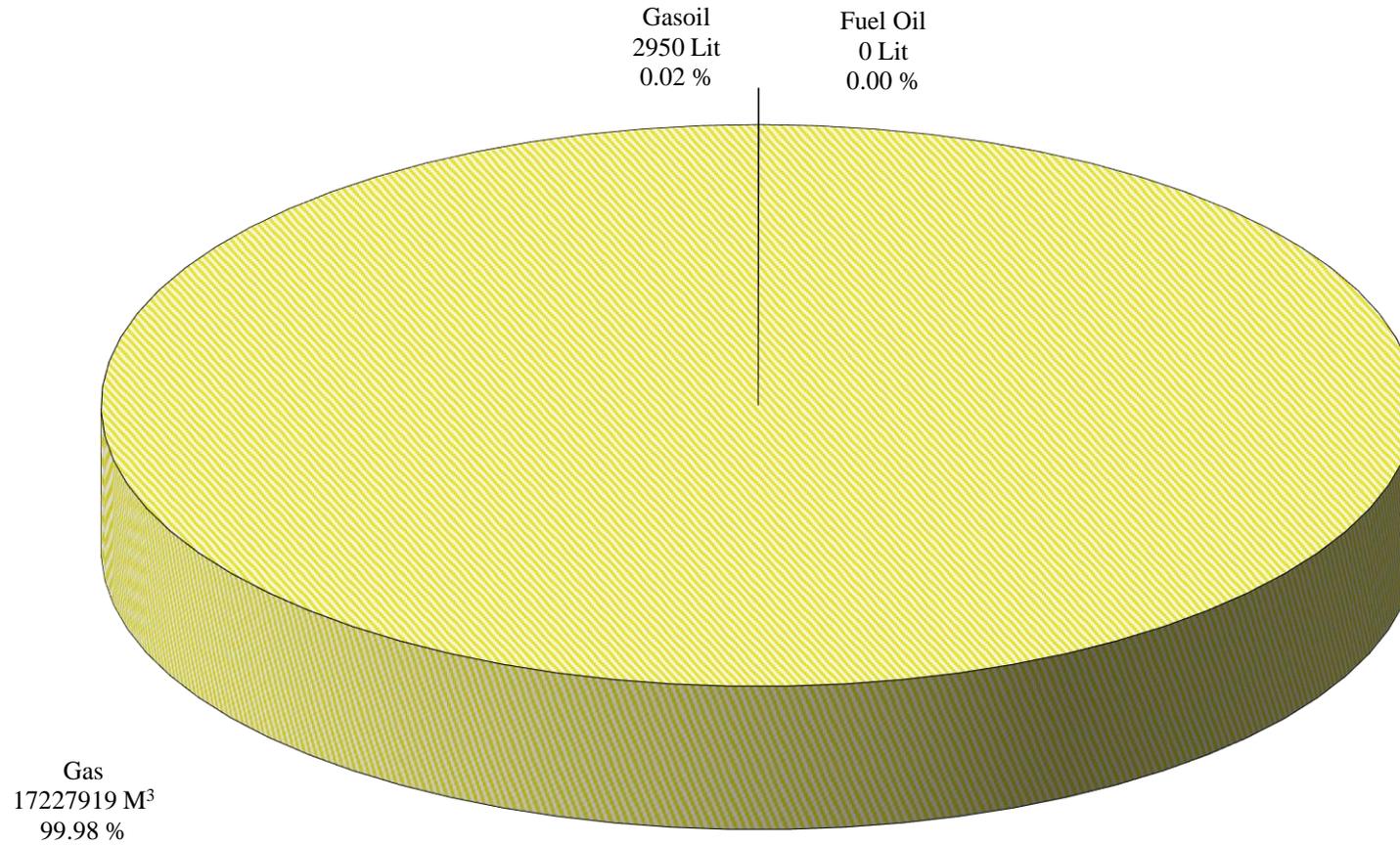
Total Plants Information from First Synchronizing & This Year til (1396/12/29)

| Plants code | Nom. Power (MW) | Net Power (MW) | First Synchronize Date | Gross Production (MWH) | | Net Production (MWH) | |
|----------------|-----------------------|----------------------|------------------------------|---------------------------|--------------------|-------------------------|--------------------|
| | | | | F.Synch. | This Year | F.Synch. | This Year |
| EST | 830 | 765.5 | 48/08/04 | 162993586.800 | 3880601.000 | 145332579.800 | 3572478.000 |
| | | | 48/08/04 | | | | |
| | | | 53/11/06 | | | | |
| | | | 59/12/20 | | | | |
| | | | 67/01/01 | | | | |
| HSG | 87 | 69.0 | 70/01/20 | 1124353.543 | 49540.000 | 1026062.350 | 49455.960 |
| | | | 68/04/15 | | | | |
| | | | 68/11/10 | | | | |
| Total | 87 | 834.5 | | 164117940.343 | 3930141.000 | 146358642.150 | 3621933.960 |

Monthly Plants Gross Production Graph - Esfand 1396



Plants Fuel Consumption Comparison - Esfand 1396



Plants Thermoelectric Information - Esfand 1396

| <i>Plant Code</i> | <i>Nominal Power (MW)</i> | <i>Production</i> | | <i>Fuel Consumption</i> | | | <i>Heat Rate Kcal/Kwh</i> | <i>Steam Outage No.</i> | | <i>Succ. Start</i> |
|-------------------|---------------------------|--------------------|------------------|-------------------------|---------------------|-----------------|---------------------------|-------------------------|------------------|--------------------|
| | | <i>Gross (MWH)</i> | <i>Net (MWH)</i> | <i>Fuel Oil (Lit)</i> | <i>Gasoil (Lit)</i> | <i>Gas (MC)</i> | | <i>This mounth</i> | <i>This year</i> | <i>Gas No.</i> |
| EST | 830 | 62684.000 | 58237.000 | 0 | 0 | 17214000 | 2371 | 0 | 41 | ----- |
| HSG | 69 | 39.000 | 34.410 | ----- | 2950 | 13919 | 3738 | ----- | ----- | 2 |
| TOTAL | 899 | 62723.000 | 58271.410 | 0 | 2950 | 17227919 | 2372 | 0 | 41 | 2 |

*** GAS CONSUMTION IS ACCORDING TO ESFEHAN POWER PLANT COUNTERS.**

Monthly Plants Avai. & Unavailability - Esfand 1396

| Plant Code | Energy (MWH) | | | | Avail. | Unavailability | | | | | | | | | | | | | | | | | | | | Total | | | |
|--|--------------|-----------|------------|-----------|--------|----------------------|-------|-------|-------|-----------------------|-------|-------|--------|-------|-------|--------|---|---------------|-------|-------|-------|-------|---------------|-------|-------|-------|-------|-------|--------|
| | Nominal | Gross | Int. Cons. | Net | | Outage (Internal)% | | | | Outage (External) % | | | | | | PO | PM | Limit. Int. % | | | | | Limit. Ext. % | | | | | | |
| | | | | | | FO | FA | FS | FP | FG | FQ | FD | FC | FW | R | | | LF1 | LF2 | LA | LP | RLF1 | SR | LQ | LG | | LW | LD | LC |
| EST | 577680 | 62684.000 | 4447.000 | 58237.000 | 10.85% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 44.95% | 0.00% | 0.00% | 38.55% | 2.04% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.92% | 0.00% | 0.00% | 0.00% | 0.00% | 2.69% | 89.15% |
| HSG | 48024 | 39.000 | 4.590 | 34.410 | 0.08% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 33.33% | 33.33% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 33.25% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 99.92% |
| Total | 625704 | 62723.000 | 4451.590 | 58271.410 | 10.02% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 41.50% | 0.00% | 0.00% | 38.15% | 4.44% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 3.40% | 0.00% | 0.00% | 0.00% | 0.00% | 2.48% | 89.98% |
| <p>=LF1 محدودیت فنی ، بخشی از محدودیت باعلل داخلی بدون برنامه مربوط به خرابی یا عملکرد نامطلوب تجهیزات</p> <p>=LF2 خطای عملیات ، هر نوع خطا در عملیات کلیدزنی و دیگر عملیات بهره برداری یا هر نوع خطا در عملیات سرویس که در حین کار موجب محدودیت در قابلیت تولید شود</p> <p>=LA محدودیت باهماهنگی ، حالت واحدی که محدودیت در قابلیت تولید آن در برنامه سالیانه دیده نشده ولی به ضرورت و یا با مجوز دیسپاچینگ محدود می شود</p> <p>=LP محدودیت با برنامه ، حالت واحدی که در مدار است لیکن طبق برنامه سالیانه محدودیت در قابلیت تولید دارد</p> <p>=SR حالت واحدی که قادر به تولید با قدرت کامل یا بخشی از قدرت می باشد لیکن به علت محدودیت نیاز شبکه تمام قدرت عملی خود را تولید نمی کند</p> <p>=LQ محدودیت تحویل سوخت ، ناشی از عدم تحویل سوخت به میزان معین یا در زمان مشخص</p> <p>=LG محدودیت شبکه ، ناشی از اشکالات شبکه (خطوط و پستها)</p> <p>=LW محدودیت ناشی از کمبود آب</p> <p>=LD محدودیت به علت سایر عوامل</p> <p>=LC محدودیت به علت حوادث غیر مترقبه</p> | | | | | | | | | | | | | | | | | <p>=FO تریب ، خروج اضطراری ، خروج بدلیل وقوع خرابی یا شرایط دیگر که در برنامه سالیانه دیده نشده</p> <p>=FA خروج باهماهنگی ، خروج اضطراری واحد بدون برنامه سالیانه و باهماهنگی دیسپاچینگ</p> <p>=FS خروج به علت اشکال راه اندازی</p> <p>=FP افزایش اجباری زمان تعمیرات یا زمان بازسازی</p> <p>=FG خروج بدون برنامه سالیانه بدلیل اشکالات شبکه</p> <p>=FQ خروج به علت عدم تامین سوخت</p> <p>=FD خروج به علت سایر عوامل</p> <p>=FC خروج به علت حوادث غیر مترقبه</p> <p>=FW خروج به علت کمبود آب</p> <p>=PO تعمیرات بلندمدت و تعمیرات اساسی</p> <p>=PM بازدید و تعمیرات دوره ای</p> | | | | | | | | | | | | |

Plants Annually Unavailability - 1396

| Units Trip Causes | Plants | Far. | Ord. | Khor. | Tir | Mod. | Shr. | Meh. | Abn. | Azr. | Day | Bah. | Esf. | Average |
|---|---------------|-------------|-------------|--------------|------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|----------------|
| Outage (Internal) % (FO-FA-FS-FP) | EST | 0.14% | 2.75% | 1.00% | 0.19% | 0.56% | 6.49% | 0.32% | 0.42% | 3.81% | 0.01% | 0.00% | 0.00% | 1.31% |
| | HSG | 0.00% | 0.00% | 0.00% | 2.22% | 0.00% | 0.63% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.24% |
| Outage (External) % (FG-FQ-FD-FC-FW-R) | EST | 23.26% | 3.07% | 8.50% | 11.88% | 8.66% | 5.87% | 2.00% | 0.00% | 0.28% | 6.16% | 20.08% | 44.95% | 11.22% |
| | HSG | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Overhaul (%) (PO) | EST | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 12.85% | 38.55% | 38.55% | 38.55% | 10.71% |
| | HSG | 33.33% | 33.33% | 33.33% | 33.33% | 33.33% | 33.33% | 33.33% | 33.33% | 33.33% | 33.33% | 33.33% | 33.33% | 33.33% |
| Periodic Maint. (%) (PM) | EST | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.36% | 15.40% | 2.80% | 0.00% | 0.00% | 0.00% | 2.04% | 1.80% |
| | HSG | 0.00% | 0.00% | 0.00% | 18.92% | 29.03% | 41.94% | 66.67% | 35.56% | 33.33% | 33.33% | 33.33% | 33.33% | 27.1% |
| Limit. Internal (%) (LF1-LF2-LA-LP-RLF1) | EST | 1.52% | 4.24% | 3.57% | 0.31% | 0.01% | 0.00% | 2.30% | 18.61% | 1.80% | 0.00% | 0.00% | 0.00% | 2.70% |
| | HSG | 0.00% | 0.00% | 0.00% | 2.24% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.19% |
| Limit. External (%) (SR-LQ-LG-LW-LD-LC) | EST | 8.24% | 12.42% | 15.58% | 28.62% | 32.19% | 39.14% | 21.16% | 17.01% | 7.79% | 25.12% | 19.25% | 3.61% | 19.18% |
| | HSG | 66.43% | 66.46% | 47.92% | 7.81% | 12.90% | 7.57% | 0.00% | 30.99% | 33.15% | 33.25% | 33.22% | 33.25% | 31.08% |
| Total 1396 % | ---- | 38.27% | 28.41% | 32.67% | 42.81% | 44.01% | 55.21% | 45.69% | 63.25% | 32.16% | 72.15% | 79.58% | 89.98% | 52.01% |
| Total 1395 % | ---- | 55.39% | 22.13% | 49.83% | 70.75% | 75.73% | 76.80% | 67.75% | 43.51% | 76.13% | 77.49% | 78.18% | 66.85% | 63.38% |

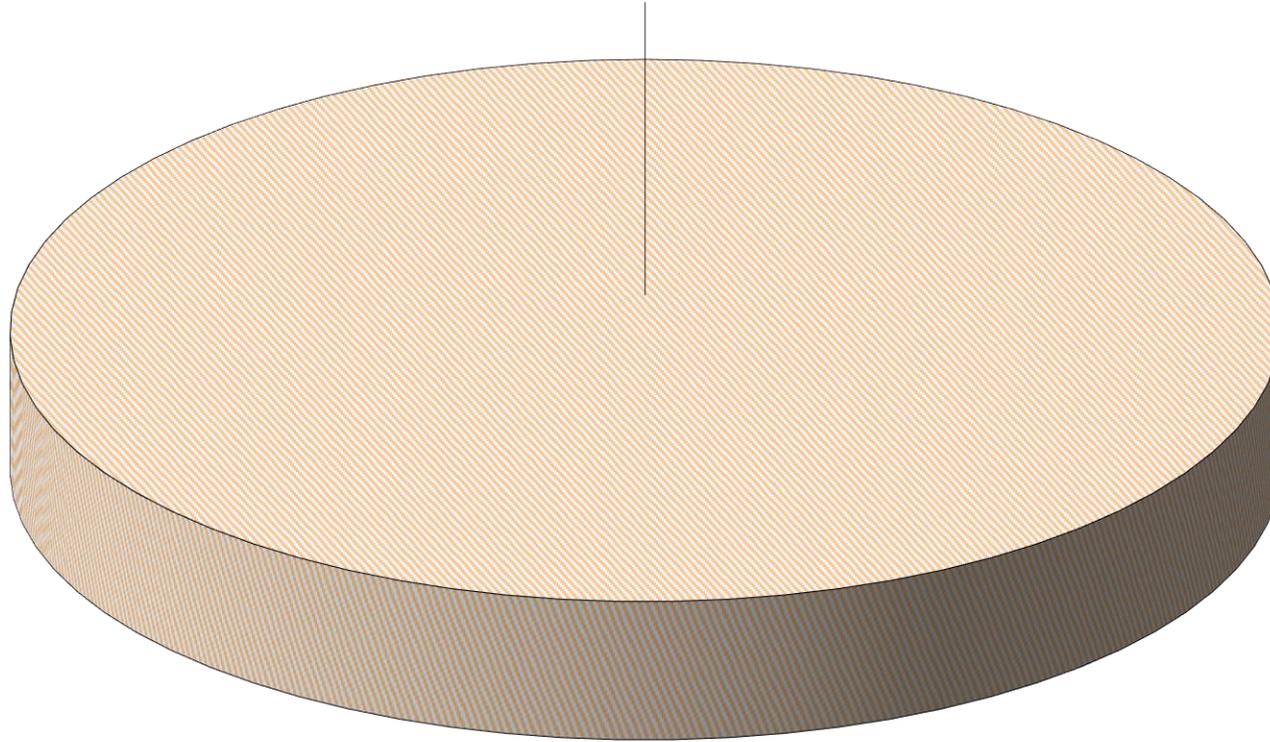
Esfahan Power Generation Management Co.
Esfahan Power Plant

Total Units Information from First Synchronizing -(1396/12/29)

| <i>Units No.</i> | <i>Nom. Power (MW)</i> | <i>Net Power (MW)</i> | <i>First Synchronize Date</i> | <i>Geo. Code</i> | <i>Gen. Code</i> | <i>Gross Production (MWH)</i> | <i>Net Production (MWH)</i> | <i>Operation Period (H)</i> | <i>Op.from last Overhaul (H)</i> |
|------------------|------------------------|-----------------------|-------------------------------|------------------|------------------|-------------------------------|-----------------------------|-----------------------------|----------------------------------|
| 1 | 35 | 32.3 | 48/08/04 | ----- | ----- | 8225265.9 | 7554668.4 | 304498.1 | 6938.0 |
| 2 | 35 | 32.3 | 48/08/04 | ----- | ----- | 9252202.6 | 8548825.5 | 336423.0 | 11293.0 |
| 3 | 120 | 110.7 | 53/11/06 | ----- | ----- | 27755405.5 | 25074221.1 | 296709.0 | 40897.0 |
| 4 | 320 | 295.1 | 59/12/20 | ----- | ----- | 59931154.0 | 53200920.7 | 241277.0 | 39927.0 |
| 5 | 320 | 295.1 | 67/01/01 | ----- | ----- | 57829558.8 | 50953944.1 | 217641.0 | 29700.0 |
| Total | 830 | 765.5 | ----- | ----- | ----- | 162993586.8 | 145332579.8 | ----- | ----- |

Units Monthly Production Comparison - Esfand 1396

| | | | |
|------------|------------|-----------|-----------|
| 1st 320 MW | 2nd 320 MW | 1st 35 MW | 2nd 35 MW |
| 0.00% | 0.00 % | 0.00 % | 0.00 % |



120 MW
100.00 %

Esfahan Power Generation Management Co.
Esfahan Power Plant

Monthly Units Thermolectric Information - Esfand 1396

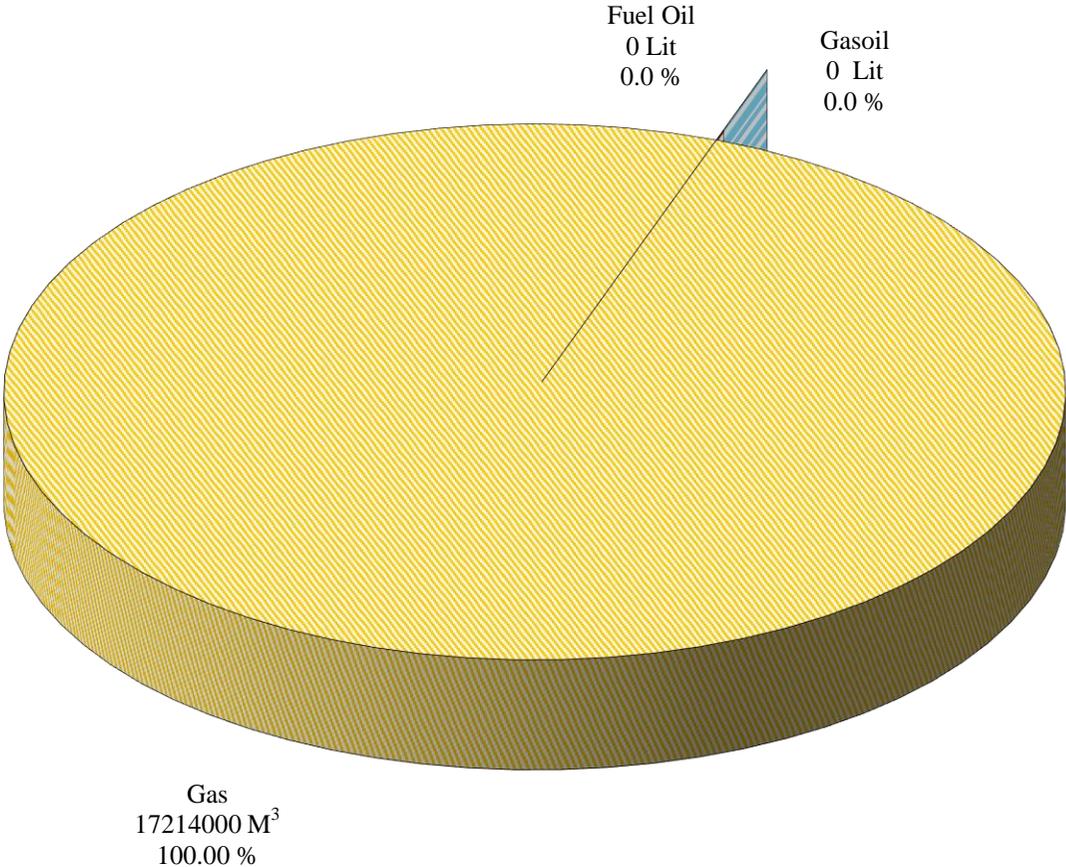
| Unit No. | Nominal Power (MW) | Production | | | Fuel Consumption | | | Heat Rate Kcal/Kwh | Operation Period H | Stop Period H | Outage No. | Load Factor % |
|---|--------------------|------------------|----------------------------|------------------|------------------|--------------|----------------------|--------------------|--------------------|---------------|------------|---------------|
| | | Gross (MWH) | Internal Consumption (MWH) | Net (MWH) | Fuel Oil (Lit) | Gasoil (Lit) | Gas (MC) | | | | | |
| 1 | 35 | 0.000 | 36.000 | -36.000 | 0 | 0 | 0 | 0 | 0 | 696 | 0 | 0.00% |
| 2 | 35 | 0.000 | 37.000 | -37.000 | 0 | 0 | 0 | 0 | 0 | 696 | 0 | 0.00% |
| 3 | 120 | 62684.000 | 3961.000 | 58723.000 | 0 | 0 | 17214000 | 2371 | 696 | 0 | 0 | 75.05% |
| 4 | 320 | 0.000 | 101.000 | -101.000 | 0 | 0 | 0 | 0 | 0 | 696 | 0 | 0.00% |
| 5 | 320 | 0.000 | 273.000 | -273.000 | 0 | 0 | 0 | 0 | 0 | 696 | 0 | 0.00% |
| مصروف متفرقه | | | 39.000 | | | | | | | | | |
| TOTAL | 830 | 62684.000 | 4447.000 | 58237.000 | 0 | 0 | 17214000 | 2371 | ----- | ----- | 0 | 75.05% |
| Total Fuel Consumption from First of this year till End this month | | | | | 0 | 0 | 1,063,643,000 | | | | | |
| | | | | | 0.00% | 0.00% | 100.00% | | | | | |

Esfahan Power Generation Management Co.
Esfahan Power Plant

Units Annually Unavailability - 1396

| <i>Units Trip Causes</i> | Plants | Far. | Ord. | Khor. | Tir | Mod. | Shr. | Meh. | Abn. | Azr. | Day | Bah. | Esf. | Average |
|---|--------|--------|--------|--------|---------|---------|--------|--------|--------|--------|---------|---------|---------|---------|
| <i>Outage (Internal) % (FO-FA-FS-FP) (%)</i> | 1 | 0.00% | 0.65% | 0.00% | 0.00% | 0.00% | 0.00% | 4.52% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.43% |
| | 2 | 0.25% | 0.10% | 0.00% | 0.00% | 2.38% | 0.00% | 2.88% | 0.00% | 0.00% | 0.14% | 0.00% | 0.00% | 0.48% |
| | 3 | 0.31% | 0.00% | 6.87% | 1.33% | 3.19% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.97% |
| | 4 | 0.21% | 0.00% | 0.00% | 0.00% | 0.00% | 7.01% | 0.00% | 0.00% | 0.00% | 4.87% | 0.00% | 0.00% | 1.01% |
| | 5 | 0.00% | 7.05% | 0.00% | 0.00% | 0.00% | 9.83% | 0.00% | 1.08% | 5.01% | 0.00% | 0.00% | 0.00% | 1.92% |
| <i>Outage (External) % (FG-FQ-FD-FC-FW-R) (%)</i> | 1 | 80.81% | 72.74% | 32.02% | 100.00% | 100.00% | 67.74% | 10.52% | 0.00% | 6.60% | 100.00% | 100.00% | 75.86% | 62.19% |
| | 2 | 16.13% | 0.00% | 32.24% | 100.00% | 55.59% | 71.42% | 36.83% | 0.00% | 0.00% | 46.19% | 10.00% | 75.86% | 37.02% |
| | 3 | 0.00% | 0.00% | 0.00% | 0.00% | 14.50% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 52.04% | 0.00% | 5.55% |
| | 4 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | 5 | 49.72% | 0.00% | 15.02% | 8.94% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 20.53% | 100.00% | 16.18% |
| <i>Overhaul %(PO)</i> | 1 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | 2 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | 3 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | 4 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 33.33% | 100.00% | 100.00% | 100.00% | 27.78% |
| | 5 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| <i>Periodic Maint. %(PM)</i> | 1 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 32.26% | 24.79% | 0.00% | 0.00% | 0.00% | 0.00% | 24.14% | 6.77% |
| | 2 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 24.14% | 2.01% |
| | 3 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 10.00% | 19.37% | 0.00% | 0.00% | 0.00% | 0.00% | 2.45% |
| | 4 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | 5 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 33.47% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 2.79% |
| <i>Limit. Internal (LF1-LF2-LA-LP-RLF1) (%)</i> | 1 | 0.00% | 13.15% | 32.83% | 0.00% | 0.00% | 0.00% | 7.43% | 8.40% | 2.56% | 0.00% | 0.00% | 0.00% | 5.36% |
| | 2 | 0.03% | 0.13% | 0.01% | 0.00% | 0.14% | 0.00% | 6.69% | 7.10% | 2.28% | 0.10% | 0.00% | 0.00% | 1.37% |
| | 3 | 1.82% | 5.45% | 4.36% | 0.05% | 0.00% | 0.00% | 1.32% | 0.20% | 0.00% | 0.00% | 0.00% | 0.00% | 1.10% |
| | 4 | 2.80% | 6.47% | 3.88% | 0.00% | 0.00% | 0.00% | 3.93% | 45.12% | 2.92% | 0.00% | 0.00% | 0.00% | 5.43% |
| | 5 | 0.48% | 1.02% | 0.13% | 0.77% | 0.00% | 0.00% | 0.00% | 1.34% | 1.23% | 0.00% | 0.00% | 0.00% | 0.42% |
| <i>Limit. External (SR-LQ-LG-LW-LD-LC) (%)</i> | 1 | 2.22% | 0.40% | 0.20% | 0.00% | 0.00% | 0.00% | 0.47% | 0.84% | 0.12% | 0.00% | 0.00% | 0.00% | 0.35% |
| | 2 | 2.61% | 0.40% | 0.00% | 0.00% | 0.00% | 2.69% | 1.19% | 1.48% | 0.00% | 0.00% | 13.09% | 0.00% | 1.79% |
| | 3 | 14.93% | 10.26% | 19.22% | 35.33% | 29.87% | 44.69% | 22.21% | 21.48% | 8.54% | 44.49% | 22.11% | 24.95% | 24.84% |
| | 4 | 14.11% | 13.65% | 20.50% | 36.56% | 38.76% | 43.55% | 25.18% | 11.65% | 7.74% | 0.00% | 0.00% | 0.00% | 17.64% |
| | 5 | 1.17% | 14.61% | 12.72% | 24.44% | 33.56% | 40.91% | 21.22% | 24.15% | 9.26% | 48.48% | 40.24% | 0.00% | 22.56% |
| Total 1396 % | ---- | 33.16% | 28.36% | 28.63% | 41.00% | 41.41% | 52.86% | 41.17% | 38.82% | 26.54% | 69.85% | 77.89% | 89.15% | 47.13% |
| Total 1395 % | ---- | 51.70% | 15.73% | 47.50% | 70.88% | 77.03% | 75.65% | 65.60% | 60.20% | 74.16% | 75.70% | 76.38% | 64.11% | 62.78% |

Fuel Type & Consumption - Esfand 1396



Monthly Fuel Consumption - Delivered - Deviation - Store , Esfand 1396

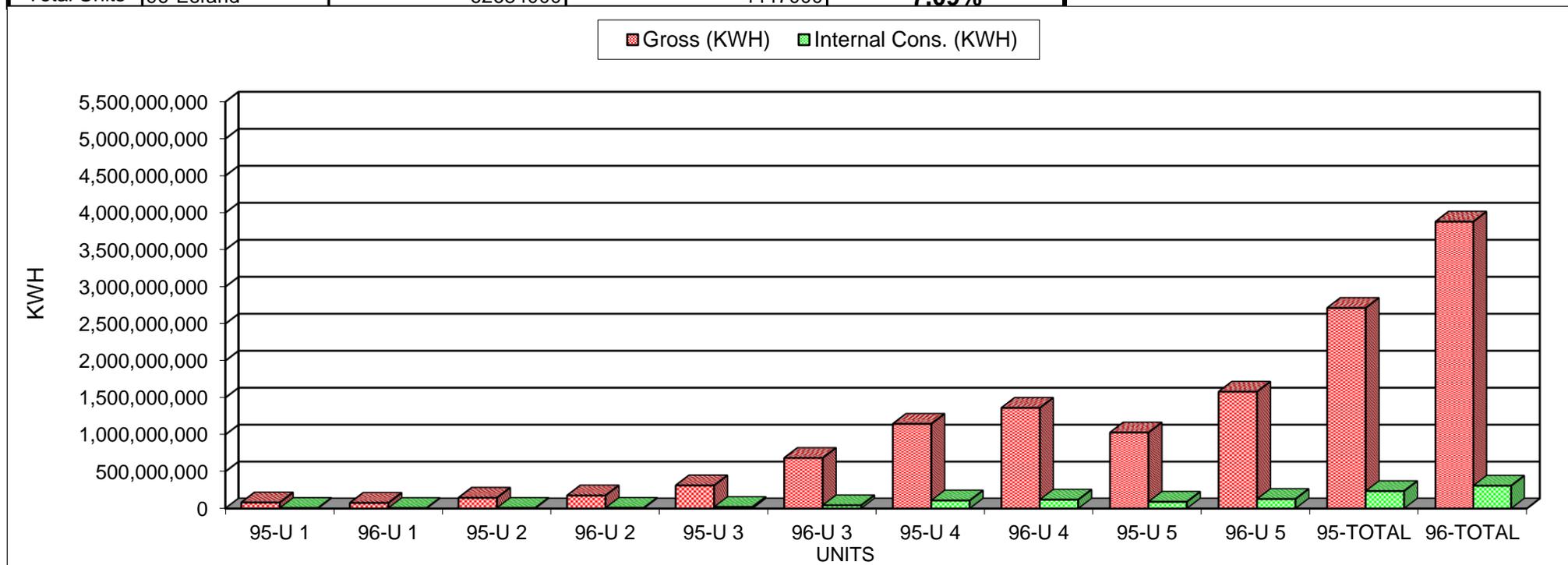
| | CONSUMPTION(This Month) | | Consumption Deviation Refrence Gas Company-Counter This month | Delivered Refinery or Gas Company | | Store | | CONSUMPTION(Till this Month) | | Consumption Deviation Refrence Gas Company-Counter Till this month |
|------------------|--|------------|--|--------------------------------------|------------|------------|------------|--|---------------|---|
| | Unloading Plant(Store) - Gas Company | Counter | | Till this month | This Month | Last Month | This Month | Unloading Plant(Store) Gas Company | Counter | |
| | | | | | | | | | | |
| Fuel Oil (LIT) | 0 | 0 | <u>0</u> | 0 | 0 | 26,496,364 | 26,496,364 | 17,655,916 | 0 | <u>17,655,916</u> |
| Light Oil (LIT) | 0 | 0 | <u>0</u> | 0 | 0 | 632,320 | 632,320 | 0 | 0 | <u>0</u> |
| MISC Consumption | | 0 | | | | | | | | |
| Natural Gas (M3) | 18,731,046 | 17,214,000 | <u>1,517,046</u> | 1,065,622,161 | 18,731,046 | ----- | ----- | 1,065,622,161 | 1,063,643,000 | <u>1,979,161</u> |

**** مازوت ورودی هم در دمای 60 درجه وهم در دمای طبیعی ثبت شده است ****

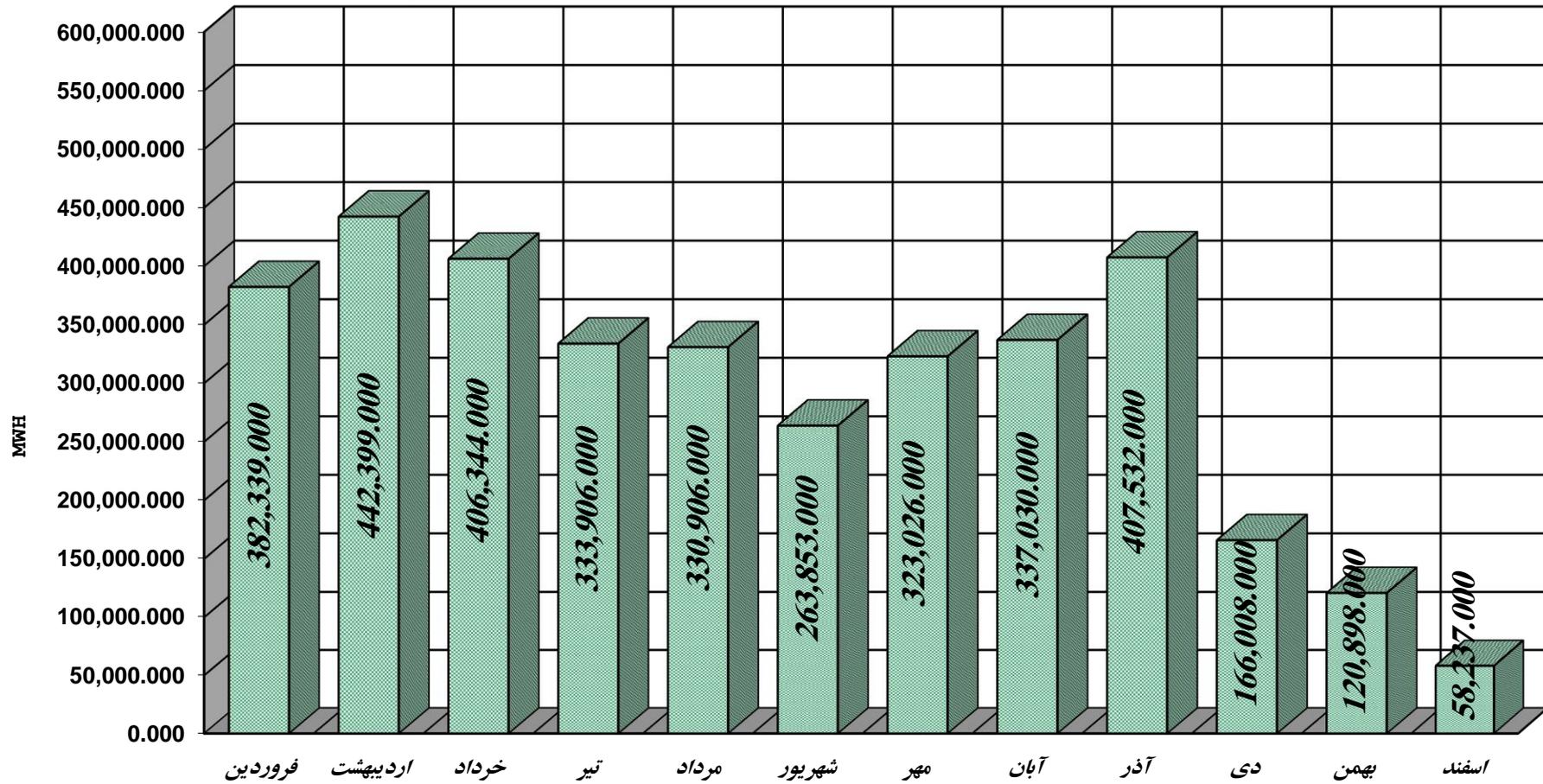
بعلت تخلیه مخزن ۱۶ و عودت سوخت به پالایشگاه در تاریخ ۱۳۹۶/۰۷/۲۲ موجودی سوخت مازوت طبق برگه دیپ زنی ۲۶/۴۹۶/۳۶۴ لیتر گردید و ۱۶/۶۲۰/۱۲۱ لیتر عودت شده و کاهش یافت. همچنین ۱/۰۳۵/۷۹۵ لیتر در اختیار پیمانکار بازیافت مواد نفتی قرار گرفت. کلیه اسناد و صورتجلسات موجود می باشد.

GROSS PRODUCTION , INTERNAL CONS. COMPARISON 12 MONTH 95 - 96

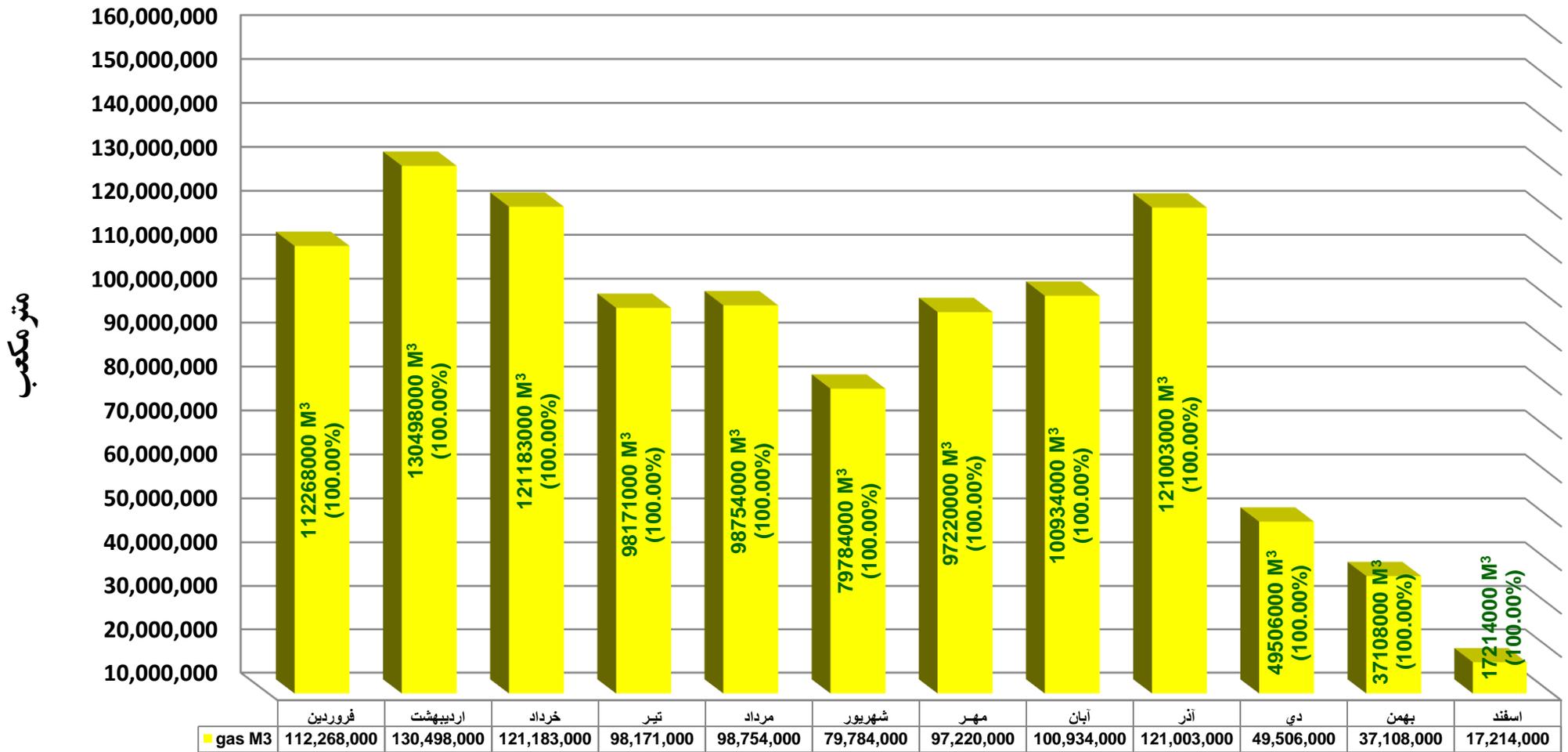
| Unit No. | Year | Gross (KWH) | Internal Cons. (KWH) | Internal Cons. (%) |
|-------------|-----------|-------------|----------------------|--------------------|
| 1 | 95-U 1 | 81239000 | 6758000 | 8.32% |
| | 96-U 1 | 75824000 | 6427000 | 8.48% |
| 2 | 95-U 2 | 145629000 | 7852000 | 5.39% |
| | 96-U 2 | 176343000 | 8924000 | 5.06% |
| 3 | 95-U 3 | 311981000 | 20549000 | 6.59% |
| | 96-U 3 | 684480000 | 43447000 | 6.35% |
| 4 | 95-U 4 | 1146143000 | 108032000 | 9.43% |
| | 96-U 4 | 1362812000 | 119794000 | 8.79% |
| 5 | 95-U 5 | 1028617000 | 90993000 | 8.85% |
| | 96-U 5 | 1581142000 | 128611000 | 8.13% |
| TOTAL | 95-TOTAL | 2713609000 | 235279000 | 8.67% |
| TOTAL | 96-TOTAL | 3880601000 | 308123000 | 7.94% |
| Total Units | 95-Esfand | 214485000 | 18367000 | 8.56% |
| Total Units | 96-Esfand | 62684000 | 4447000 | 7.09% |



Monthly Net Generation Comparison in year 1396



Monthly Fuel Consumption Comparison in year 1396 (According to E.P.P Counters)

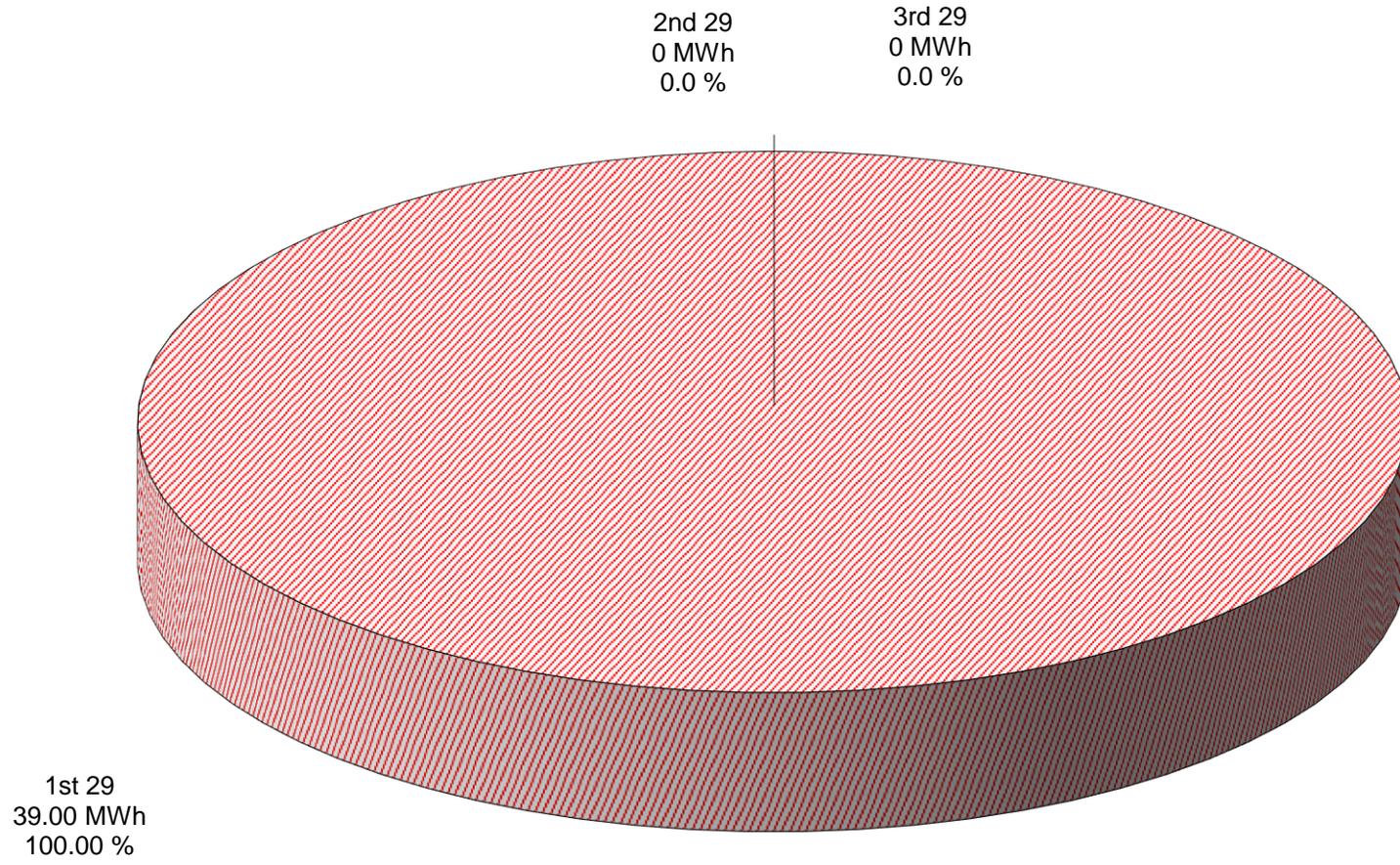


Esfahan Power Generation Management Co.
Hesa Power Plant

Total Units Information from First Synchronizing (1396/12/29)

| <i>Units No.</i> | <i>Nom. Power (MW)</i> | <i>Net Power (MW)</i> | <i>First Synchronize Date</i> | <i>Geo. Code</i> | <i>Gen. Code</i> | <i>Gross Production (MWH)</i> | <i>Net Production (MWH)</i> | <i>Operation Period (H)</i> | <i>Op.from last Overhaul (H)</i> | <i>Equivalent hours (H)</i> |
|------------------|------------------------|-----------------------|-------------------------------|------------------|------------------|-------------------------------|-----------------------------|-----------------------------|----------------------------------|-----------------------------|
| 1 | 29 | 23 | 70/01/20 | ----- | ----- | 390955.1 | 341062.1 | 21108 | 3479 | 5561.9 |
| 2 | 29 | 23 | 68/04/15 | ----- | ----- | 507409.8 | 476058.6 | 26391 | 2328 | 3428.1 |
| 3 | 29 | 23 | 68/11/10 | ----- | ----- | 225988.6 | 208941.7 | 0 | 0 | 0 |
| Total | 87 | 69 | ----- | ----- | ----- | 1124353.5 | 1026062.35 | ----- | ----- | |

Units Monthly Production Comparison - Esfand 1396



Esfahan Power Generation Management Co.
Hesa Power Plant

Monthly Units Thermoelectric Information - Esfand 1396

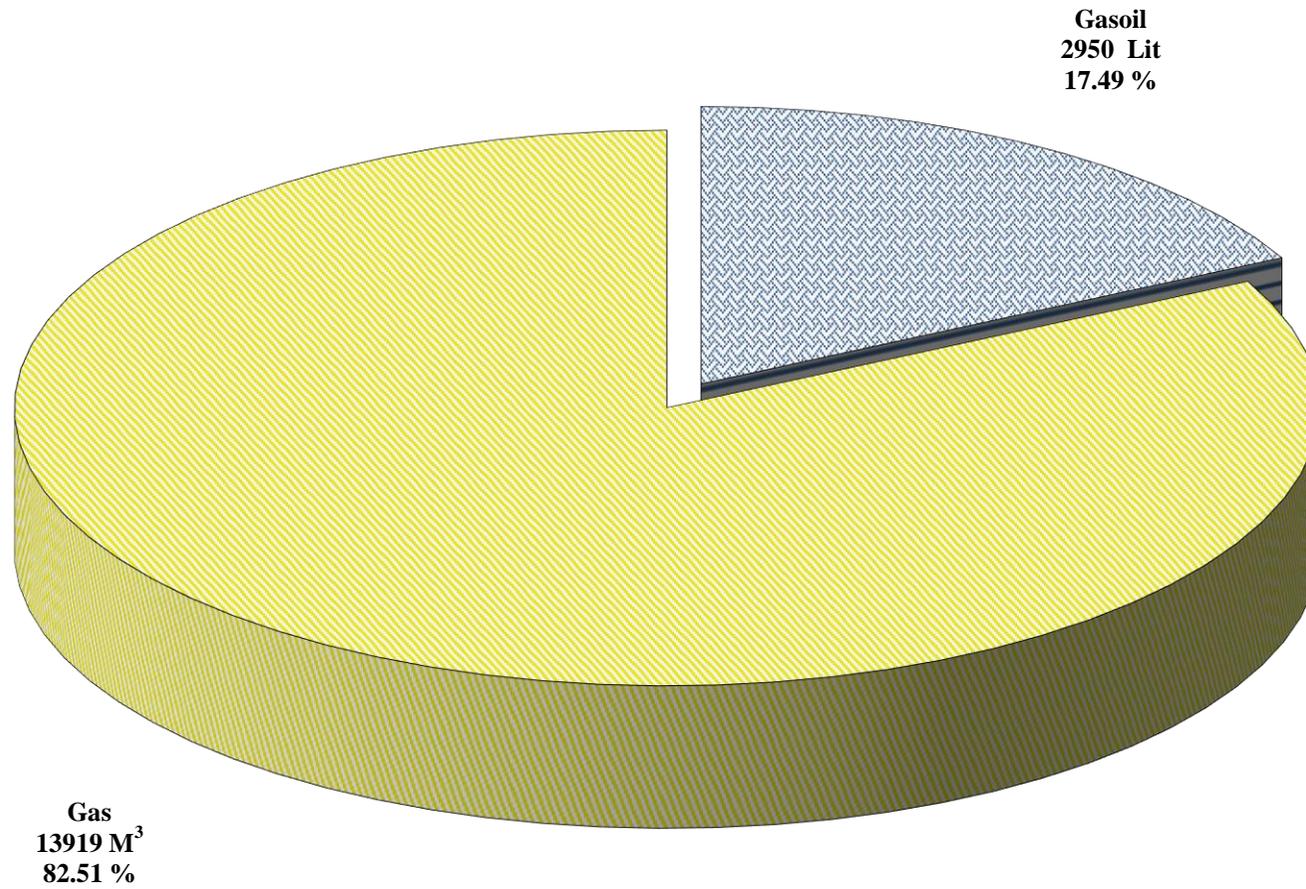
| <i>Unit No.</i> | <i>Nominal Power (MW)</i> | <i>Production</i> | | <i>Fuel Consumption</i> | | <i>Heat Rate Kcal/Kwh</i> | <i>Operation Period H</i> | <i>Stop Period H</i> | <i>Succ. Start No.</i> | <i>Load Factor %</i> |
|-----------------|---------------------------|--------------------|------------------|-------------------------|-----------------|---------------------------|---------------------------|----------------------|------------------------|----------------------|
| | | <i>Gross (MWH)</i> | <i>Net (MWH)</i> | <i>Gasoil (Lit)</i> | <i>Gas (MC)</i> | | | | | |
| 1 | 23 | 39.000 | 34.410 | 2950 | 13919 | 3738 | 3 | 693 | 2 | 56.5 % |
| 2 | 23 | 0.000 | 0.000 | 0 | 0 | 0 | 0 | 696 | 0 | 0.0 % |
| 3 | 23 | 0.000 | 0.000 | 0 | 0 | 0 | 0 | 696 | 0 | 0.0 % |
| TOTAL | 69 | 39.000 | 34.410 | 2950 | 13919 | 3738 | 3 | ----- | 2 | 56.5 % |

Esfahan Power Generation Management Co.
Hesa Power Plant

Units Annually Unavailability - 1396

| Units Trip Causes | Plants | Far. | Ord. | Khor. | Tir | Mod. | Shr. | Meh. | Abn. | Azr. | Day | Bah. | Esf. | Average |
|---|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Outage (Internal) % (FO-FA-FS-FP) (%) | 1 | 0.00% | 0.00% | 0.00% | 1.71% | 0.00% | 1.89% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.30% |
| | 2 | 0.00% | 0.00% | 0.00% | 4.94% | 0.00% | 0.41% |
| | 3 | 0.00% |
| Outage (External) % (FG-FQ-FD-FC-FW-R) (%) | 1 | 0.00% |
| | 2 | 0.00% |
| | 3 | 0.00% |
| Overhaul %(PO) | 1 | 0.00% |
| | 2 | 0.00% |
| | 3 | 100.00% |
| Periodic Maint. %(PM) | 1 | 0.00% | 0.00% | 0.00% | 34.19% | 0.00% | 25.81% | 100.00% | 6.67% | 0.00% | 0.00% | 0.00% | 0.00% | 13.89% |
| | 2 | 0.00% | 0.00% | 0.00% | 22.58% | 87.10% | 100.00% | 67.47% |
| | 3 | 0.00% |
| Limit. Internal (LF1-LF2-LA-LP-RLF1) (%) | 1 | 0.00% | 0.00% | 0.00% | 2.21% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.01% | 0.00% | 0.18% |
| | 2 | 0.00% | 0.00% | 0.00% | 4.49% | 0.00% | 0.37% |
| | 3 | 0.00% |
| Limit. External (SR-LQ-LG-LW-LD-LC) (%) | 1 | 99.29% | 99.38% | 54.71% | 12.62% | 30.92% | 22.71% | 0.00% | 92.98% | 99.46% | 99.76% | 99.65% | 99.76% | 67.60% |
| | 2 | 100.00% | 100.00% | 89.04% | 10.80% | 7.77% | 0.00% | 25.63% |
| | 3 | 0.00% |
| Total 1396 % | ---- | 99.76% | 99.79% | 81.25% | 64.52% | 75.26% | 83.47% | 100.00% | 99.88% | 99.82% | 99.92% | 99.89% | 99.92% | 91.80% |
| Total 1395% | ---- | 99.77% | 99.12% | 77.88% | 69.18% | 60.15% | 90.60% | 93.57% | 99.93% | 99.87% | 98.99% | 99.81% | 99.86% | 90.57% |

Fuel Type & Consumption - Esfand 1396

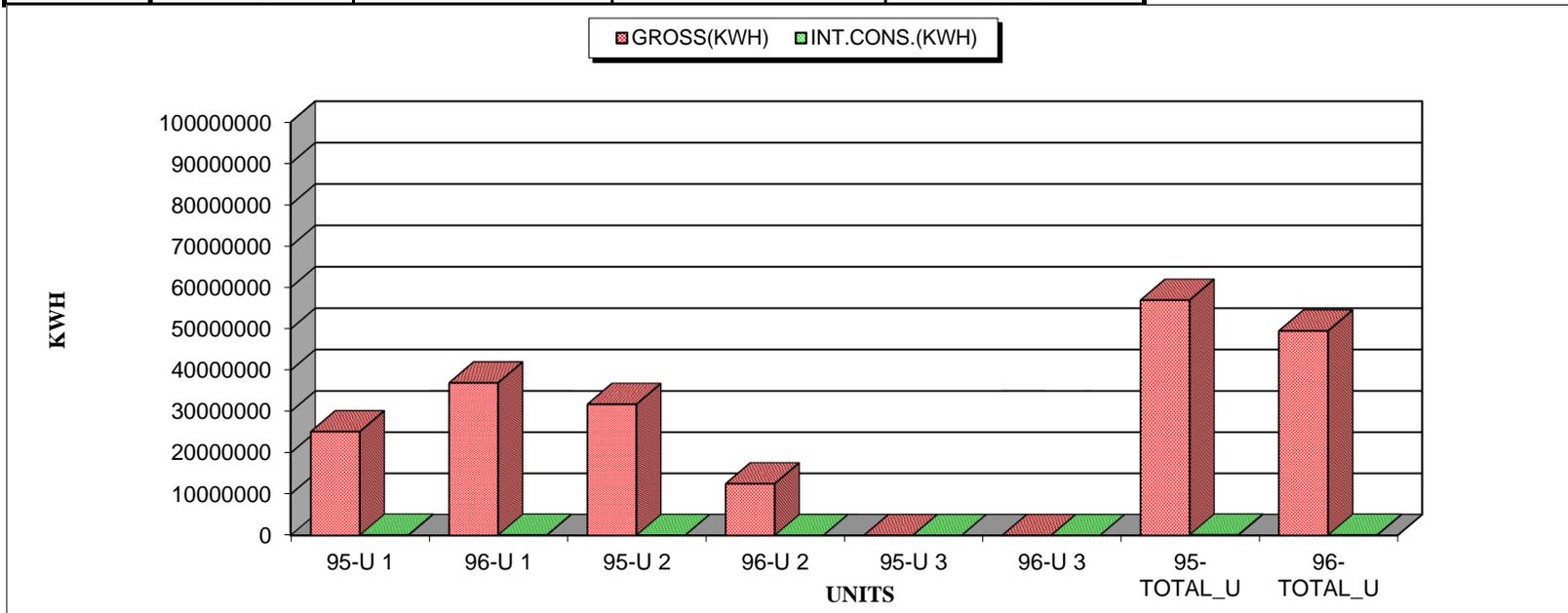


Monthly Fuel Consumption - Delivered - Deviation - Store , Esfand 1396

| | CONSUMPTION (This Month) | | Consumption Deviation Refrence Gas Company - Counter This month | Delivered Refinery or Gas Company | | Store | | CONSUMPTION (Till this year) | | Consumption Deviation Refrence Gas Company - Counter Till this month |
|------------------|--|---------|--|--------------------------------------|------------|------------|------------|--|------------|---|
| | Unloading Plant(Store) - Gas Company | Counter | | Till this month | This Month | Last Month | This Month | Unloading Plant(Store) - Gas Company | Counter | |
| | | | | | | | | | | |
| Light Oil (LIT) | 2,950 | 2,950 | <u>0</u> | 0 | 0 | 3,315,444 | 3,312,494 | 28,418 | 44,771 | <u>0</u> |
| MISC Consumption | | 0 | | | | | | | | |
| Natural Gas (M3) | 13,919 | 13,919 | <u>0</u> | 19,222,327 | 13,919 | ----- | ----- | 19,222,327 | 19,222,327 | <u>0</u> |

GROSS PRODUCTION , INTERNAL CONS. COMPARISON 12 MONTH 95 - 96

| Unit No. | Year | Gross (KWH) | Internal Cons. (KWH) | Internal Cons. (%) |
|----------|------------|-------------|----------------------|--------------------|
| 1 | 95-U 1 | 25179000 | 93454 | 0.37% |
| | 96-U 1 | 37001000 | 76680 | 0.21% |
| 2 | 95-U 2 | 31798000 | 21166 | 0.07% |
| | 96-U 2 | 12539000 | 7360 | 0.06% |
| 3 | 95-U 3 | 0 | 0 | 0.00% |
| | 96-U 3 | 0 | 0 | 0.00% |
| TOTAL | 95-TOTAL_U | 56977000 | 114620 | 0.20% |
| TOTAL | 96-TOTAL_U | 49540000 | 84040 | 0.17% |



DESCRIPTION OF ABBREVIATIONS

| Code | DESCRIPTION |
|------|---------------------|
| S | STEAM TURBINE |
| G | GAS TURBINE |
| TPP | THERMAL POWER PLANT |
| GPP | GAS POWER PLANT |
| EST | ESFAHAN POWER PLANT |
| HSG | HESA POWER PLANT |